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# THE SCIENTIFIC FRAUDS BEHIND THE FALSE VACCINE-AUTISM CLAIM

Hans J. Eysenck: Downfall of a Charlatan
Why We Need Science
The Scientist's Skepticism
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Inquiries from the media and the public about the work of the Committee should be made to Barry Karr, Executive Director, CSI, P.O. Box 703, Amherst, NY 14226-0703. Tel.:716-636-1425. Fax: 716-636-1733. Email: bkarr@centerforinquiry.org.

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## [ FROM THE EDITOR

# Two Scientific Frauds: Wakefield and Eysenck

Vaccines are back in the news big time in this dreadful year of 2020. The coronavirus pandemic has demonstrated how vital vaccines are. Without a vaccine for COVID-19, we have all been in peril this year. The world needs a vaccine badly—a safe and effective one—so that we can all get back to normal living. The race is on.

But before that, vaccines have been in the news for another reason—the rising anti-vaccine movement. The modern anti-vaxxers got their boost with what turned out to be a false claim: the measles-mumps-rubella (MMR) vaccine could cause autism. Science-minded people soon knew that claim was wrong and based on retracted, fraudulent research, but certain vociferous segments of the public held on to their suspicions of a link. They have been energized by recent notorious films and social media campaigns propagandizing against vaccines.

For all those reasons, it seems a good time to revisit the origin case. Peter M. Steinmetz, MD, does so in our cover article, "The Scientific Frauds Underlying the False MMR Vaccine-Autism Link." Steinmetz describes the six fabrications and falsifications in Dr. Andrew Wakefield's original (and later retracted) 1998 *Lancet* paper and his subsequent written response to criticisms. Steinmetz is a research neurologist and chief scientist at the Neurtex Brain Research Institute. "The scientific frauds in Wakefield's 1998 paper are clear from the readily available records," he concludes, "and it is clear why this paper was eventually retracted when the full record became available."

* * *

Hans J. Eysenck was one of psychology's towering figures, but skeptics have long viewed him with suspicion because of his credulous stance on paranormal claims and his coauthoring four books promoting parapsychology with discredited author Carl Sargent. Now we know things were far worse than even that. In this issue, U.K. psychologist David Marks outlines what he calls "an orchestrated saga of intellectual dishonesty" by the late British psychologist Eysenck and two collaborators. In "Hans J. Eysenck: The Downfall of a Charlatan," Marks reveals a bone-shivering "story that must be told": A pattern of data manipulation by Eysenck and two of his collaborators can be traced back over decades, even as early as 1946. Eysenck had been accused of cheating way back in the 1960s, but no action was taken. Sargent was accused of fraud in 1979, but Eysenck continued collaborating with him over the next five years in books that "grossly distorted the scientific evidence of the paranormal." Now the dirty secrets are out. Journals have retracted fourteen of Eysenck's papers and published seventy-one expressions of concern.

We were first alerted to the latest scandal about Eysenck by our skeptic colleagues in the Netherlands. We soon turned to Marks himself, who has published the revelatory article by Anthony Pelosi plus a scathing editorial of his own in *The Journal of Health Psychology*, which Marks edits. King's College London deemed twenty-five publications by Eysenck and another collaborator (not Sargent) "unsafe," yet Marks says the true number of unsafe Eysenck publications is most likely over 100. Marks is a longtime colleague of CSI and the Skeptical Inquirer and author of a classic work, *The Psychology of the Psychic*, and the just-published *Psychology and the Paranormal*. He has been courageous and forthright in his exposure and condemnation of Eysenck. He hopes that "future Hans Eysencks can be stopped in their tracks."

—Kendrick Frazier

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# Conspiracy Theories Grow as COVID-19 Spreads

Benjamin Radford

Conspiracy theories are common, especially during times of stress and social upheaval. So far in 2020, America has seen a confluence of stressors, including the COVID-19 pandemic and race riots across the country. As of this writing, there's no clear end in sight for either.

The Center for Inquiry, publisher of Skeptical Inquirer with the Committee for Skeptical Inquiry, created a Coronavirus Resource Center website to help news media and the public sort fact from fiction, and coronavirus misinformation has been addressed in recent issues of this magazine. There are many facets to the problem, and one of the most pernicious is the conspiracy theories. But how widespread are they?

Genuine endorsement of conspiracies is difficult to measure on social media. Research shows that most people don't read past the headline of the stories they ostensibly endorse and share, so they often spread information that they may not sincerely believe—or in some cases even understand. Instead, many use the stories as a sort of symbolic endorsement, sharing memes and headlines that generally align with their social and political views.

A recent Pew Research poll helps quantify the scope of the problem. The good news is that most people (that is, a slight majority) are skeptical of COVID-19 conspiracy theories—or at least the most common version asked about in the poll, that "powerful people intentionally planned the coronavirus outbreak."

A poll of American adults taken June 4–10 found that among those who have heard the theories (such as were promulgated by the then-recent *Plandemic* video; see "*Plandemic* Conspiracy Video Goes Viral, Sells Books," SI, September/October 2020), 51 percent said it was probably or definitely *not true* while 36 percent said it was probably or definitely *true*, with 13 percent saying they weren't sure. As expected—given the myriad conspiracies shared by President Donald Trump—the results revealed political biases, with more conservatives endorsing the conspiracy (47 percent) than rejecting it (40 percent). Meanwhile 63 percent of Democrats rejected the conspiracy, with 25 percent endorsing and about equal percentages of both parties saying they weren't sure.

As predicted, social media play an important role in disseminating conspiracies and misinformation. Those who often get their news on COVID-19 via social media platforms such as Facebook and Twitter were significantly more likely to endorse conspiracy theories than those who do not (44 percent versus 33 percent). While 19 percent of all respondents heard "a lot" about conspiracies, the number increased to 30 percent for those who often get news about the pandemic from social media.

Endorsement of conspiracy theories causes several demonstrable harms, including increasing distrust of both news organizations and medical authorities. Conspiracy theories encourage divisiveness and political fragmentation, resulting in tribalism and different groups each with their own set of subjective "facts."

Those pushing the conspiracies include antiscience "alternative medicine" promoters, right-wing professional conspiracy peddlers such as Alex Jones, some libertarian groups, conservative news media, and the Kremlin's army of disinformation disseminators. As Reuters reporter Robin Emmott noted:

> Russian media have deployed a "significant disinformation campaign" against the West to worsen the impact of the coronavirus, generate panic and sow distrust, according to a European Union document seen by Reuters. … The EU document said the Russian campaign, pushing fake news online in English, Spanish, Italian, German, and French, uses contradictory, confusing and malicious reports to make it harder for the EU to communicate its response to the pandemic. "A significant disinformation campaign by Russian state media and pro-Kremlin outlets regarding COVID-19 is ongoing," said the nine-page internal document, dated March 16. … "The overarching aim of Kremlin disinformation is to aggravate the public health crisis in Western countries … in line with the Kremlin's broader strategy of attempting to subvert European societies."

Conspiracy theories rarely kill directly; they are never helpful but are especially dangerous these days, squandering time, focus, and resources better spent trying to stem the pandemic. The COVID-19 conspiracies are a perfect storm of misinformation, danger, and political opportunity, and in these times critical thinking and skepticism are more vital than ever before.

Benjamin Radford is the deputy editor of the Skeptical Inquirer.

# Brazilian Skeptics Take Center Stage in COVID-19 Crisis

Stuart Vyse

Natalia Pasternak, a microbiologist and president of the Brazilian skeptics group.

Brazil's most prominent skeptical organization, Instituto Questão de Ciência (IQC; Question of Science Institute), is barely two years old, but the COVID-19 pandemic has thrust it into the spotlight in a fight for rational public health policy.

Once praised for its nimble and innovative responses to earlier health crises, including HIV in the 1990s and Zika in 2015, Brazil is now competing with the United States for the dubious distinction of the world's worst management of the coronavirus crisis. As in the United States, the current epidemic has been politicized to the detriment of the public's health. Brazil's president, Jair Bolsonaro, is a populist leader in the style of Turkey's Recep Tayyip Erdogan, Hungary's Viktor Orbán, the United Kingdom's Boris Johnson, and the United States' Donald Trump, and his response to the coronavirus crisis has been similar to Trump's. Bolsonaro has frequently challenged the recommendations of his health ministers and downplayed the need for isolation, calling COVID-19 "a little flu."

Throughout the epidemic, Bolsonaro has rarely used a mask and kept up a very active schedule, traveling to meetings throughout the country. He contravened health recommendations by declaring gyms, barbershops, and beauty salons essential services and, like Trump, by promoting the anti-malarial drug hydroxychloroquine despite the absence of evidence that it is effective in the treatment of COVID-19. On July 7, Bolsonaro announced that he had tested positive for COVID-19 and took hydroxychloroquine after his diagnosis in a live Facebook event.

With mixed messages coming from government authorities and health professionals, the Brazilian public has a desperate need for clear, science-based information. Fortunately, Natalia Pasternak, the president of IQC, is a microbiologist by training and a research scientist at the University of São Paulo. She was no stranger to the media before the current pandemic, frequently appearing on television and in print media to talk about homeopathy and other forms of pseudoscience. But the coronavirus outbreak has made Pasternak a highly visible spokesperson for sanity and science. She has appeared several times a week on *Jornal Nacional*, the most-watched TV newscast in the country, as well as other news programs, and she writes a weekly science column in *O Globo*, a Rio de Janeiro newspaper whose website is the fifth most popular in the country.

Brazil faces unique challenges in the fight against SARS-CoV-2. Although nationalized medicine is available to all citizens, much of the population is very poor. In the slums surrounding large cities such as Rio de Janeiro and São Paulo, many people live packed together in small areas that provide a fertile environment for the virus to spread. Although some of the earliest outbreaks were in wealthier areas of the big cities, subsequent studies showed that the coronavirus infection rates were much higher in the slums than in other parts of the country. For example, one study found an infection rate of 28 percent in Cidade de Deus, the slum made famous by the 2002 movie *City of God*. By comparison, São Paulo, the largest city in Brazil, had an infection rate of 9.5 percent.

In the long run, improving the public image of science in Brazil will require broad cultural changes. In a talk about the current situation presented in English for Skeptics in the Pub UK, Pasternak expressed the opinion that science needs a democracy to thrive, and, as a result, members of IQC consider supporting democracy a part of their mission. For obvious reasons, Pasternak holds little hope for the encouragement of either science or democracy in Brazil as long as the current regime is in power. But in the meantime, Brazil is very fortunate to have Pasternak and IQC as a counterpoint to the misinformation and pseudoscience promoted by politicized voices.

Stuart Vyse is an SI contributing editor and columnist. A longer version of this article is on our website at https://skepticalinquirer.org/exclusive/brazilian-skeptics-take-center-stage-in-the-covid-19-crisis/.

# UFOs Come Out of the Shadows. Again. Perhaps.

Mick West

"BAM!" was the one-word message a friend sent me, accompanying a link to the July 23, 2020, *New York Times* article titled "No Longer in Shadows, Pentagon's U.F.O. Unit Will Make Some Findings Public" (Blumenthal and Kean 2020).

The implication from my friend (a life-long UFO fan) was that this was a significant step on the road to "Disclosure"—the much-hoped-for event where the government will finally admit that they have evidence of alien visitors and indeed that they have had it for many years, perhaps going back to Roswell.

But the *New York Times* article in fact reveals nothing at all; it's essentially a recap of UFO-related news, some a few weeks old and some *much* older. The most recent event being reported is that there should be a public report on some findings from an "Unidentified Aerial Phenomenon Task Force." This actually dates from a month earlier, June 17, 2020, in a Senate report on the Intelligence Authorization Act for 2021, where Senator Marco Rubio (R-Florida) added a section titled "Advanced Aerial Threats," saying that UFOs have not got the attention they deserve and concluding:

> Therefore, the Committee directs the DNI, in consultation with the Secretary of Defense and the heads of such other agencies as the Director and Secretary jointly consider relevant, to submit a report within 180 days of the date of enactment of the Act, to the congressional intelligence and armed services committees on unidentified aerial phenomena (also known as "anomalous aerial vehicles"), including observed airborne objects that have not been identified. (Rubio 2020)

The language in this section was supplied by Christopher K. Mellon, a former government official who now works with Tom DeLonge (former Blink-182 singer and guitarist) at DeLonge's To the Stars Academy (TTSA). It was actually written way back in 2019, as TTSA noted on Twitter when they celebrated their victory last month:

> In May 2019 TTSA posted proposed draft language by @ChristopherKMe4 for Congress to take action & just last week the Senate Select Committee on Intelligence incorporated his long-standing suggestion to require the IC to do a full written UNCLASSIFIED assessment of the UAP issue. (To the Stars Academy 2020)

TTSA is primarily an entertainment company. They claim to also be a science and technology company, but to date, their most significant output has been a two-season show on the History Channel titled *Unidentified: Inside America's UFO Investigation*. This History Channel show, and TTSA in general, were helped by other *New York Times* UFO stories by the same two reporters.

The other media-friendly aspect of the *New York Times* story is the reporters' remarkably convoluted, hedged, qualified, and corrected account of how someone may or may not have bits of a flying saucer or at least bits of *something* … maybe.

The first version of the article that appeared in print was quite dramatic:

> Mr. [Harry] Reid, the former Democratic senator from Nevada who pushed for funding the earlier U.F.O. program when he was the majority leader, said he believed that crashes of vehicles from other worlds had occurred and that retrieved materials had been studied secretly for decades, often by aerospace companies under government contracts.

Incredible news! The leader of the U.S. Senate confirms the U.S. government is having bits of alien spaceships analyzed! Unfortunately, less than twenty-four hours later, that paragraph was changed to:

> Mr. Reid, the former Democratic senator from Nevada who pushed for funding the earlier U.F.O. program when he was the majority leader, said he believed that crashes of objects of unknown origin may have occurred and that retrieved materials should be studied.

And, even *after* this change was made, Senator Harry Reid forcefully issued a denial of any such thing on Twitter.

> I have no knowledge—and I have

> never suggested—the federal government or any entity has unidentified flying objects or debris from other worlds. I have consistently said we must stick to science, not fairy tales about little green men. (Reid 2020)

How the *New York Times* could, as they said in their correction note, have "inaccurately rendered remarks attributed to Harry Reid" so incredibly badly is difficult to comprehend. The idea that Reid believed in specifics about "crashes of vehicles from other worlds" is obviously extraordinary and likely to stir up significant media interest. It should have been fact-checked. Reid's forceful repudiation makes it very clear this was not done and brings into question the authority of the entire article.

Which brings me to Eric W. Davis. Longtime readers of Skeptical Inquirer might recognize him as the recipient of a Pigasus Award for his studies into psychic teleportation in 2004. In that study, he credulously describes the spoon-bending, teleporting, and remote-viewing skills of magician Uri Geller as actual psychic powers (Davis 2004). Davis is presented as an authority in the *New York Times* article to back up the assertion that the government has alien material in its possession. With the most repeated quote coming in this paragraph:

> Mr. Davis, who now works for Aerospace Corporation, a defense contractor, said he gave a classified briefing to a Defense Department agency as recently as March about retrievals from "off-world vehicles not made on this earth."

There are multiple problems with this. First, Davis is not a credible source. But that aside, he's supposedly telling the *New York Times* about classified information. If it's actually true, then he's committing a federal crime with significant criminal penalties. If his claim *is* true, and he actually briefed people about retrievals from "off-world vehicles not made on this earth," then how on earth is Harry Reid unaware of this? Why does Reid so forcefully deny any knowledge of any such thing? Why would Eric Davis know something that Senate Majority Leader Harry Reid would not, and also be able to talk about it?

The *New York Times* article also renders the remarks of Luis Elizondo, a former government worker who was involved in investigations of reports of unidentified objects. He now works at TTSA and is essentially the host of the History Channel show *Unidentified*. He seems to be very open to the E.T. hypothesis of UFOs. His position on the mysterious material is described in the article as:

> Mr. Elizondo is among a small group of former government officials and scientists with security clearances who, without presenting physical proof, say they are convinced that objects of undetermined origin have crashed on earth with materials retrieved for study.

That's hardly a strong endorsement. They don't quote him on the topic, and they add the disclaimer "without presenting physical proof"—which seems to me like it was added as a hedge by an editor concerned about the overly credulous tone of the article. Such hedging is scattered through the article, popping up somewhat incongruously, like this blanket qualifier:

> In some cases, earthly explanations have been found for previously unexplained incidents. Even lacking a plausible terrestrial explanation does not make an extraterrestrial one the most likely, astrophysicists say.

Or later, they seem to almost throw out the entire idea of retrieved materials:

> No crash artifacts have been publicly produced for independent verification. Some retrieved objects, such as unusual metallic fragments, were later identified from laboratory studies as man-made.

So what do we have here with this article? Not a lot, and nothing really new. But in any event, it's a bit of a mess. UFO writer Christoper Bales described it as "a total debacle," and I don't think that's entirely inaccurate. The Harry Reid error in particular is inexcusable.

Why does the *New York Times* do this? Has "the newspaper of record" really sunk to attempting a high-brow approach to tabloid topics? I think perhaps they have tasted the forbidden fruit, with incredibly high audience numbers for these UFO stories, combined with vast amounts of secondary media attention. This must have been helpful in these times of changing media preferences.

But I think that the scattered disclaimers and qualifications through the article show that the editors realized that there were problems. I've heard that as much as 1,000 words were removed from the article. Even more speculative topics were dropped during the editorial process, leaving us with this crippled, odd collection of things we already knew. It will still fan the media flames—the media loves a good UFO story—but I hope the Gray Lady will think carefully before going down this road again.

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Mick West is the author of *Escaping the Rabbit Hole: How to Debunk Conspiracy Theories Using Facts, Logic, and Respect.* He runs the website Metabunk.org, where, among many other things, he investigates UFO videos. He has just become a Skeptical Inquirer contributing editor.

# Zip Tie Abduction Rumors Spread, Lead to Panic and Arrests

Benjamin Radford

False rumors of roving bands of abductors using plastic zip ties to identify their victims have been circulating on social media since around 2018 and recently surged in popularity. The warnings, often appearing on Facebook, Twitter, NextDoor, and WhatsApp, warn people about plastic zip ties being found on their vehicles, doorknobs, fences, mailboxes, and elsewhere.

The warnings, framed with the usual "PLEASE SHARE THIS FOR PUBLIC SAFETY" preamble typical of what's sometimes called "scarelore," claim that abductors and sex traffickers leave the plastic ties to mark their targets. People—particularly women—are warned to take extra precautions or call police if they find the plastic ties. Versions of the story have surfaced in hundreds of communities over the past year, often resulting in concerned calls to local police departments.

It's not clear what the origin of the zip ties are or how common they are. A single photo of a zip tie in a viral media post can result in millions of people seeing it (and thus being warned about it), while few if any encounter them in real life. Some may be done as pranks in acts of what folklorists call "ostension," while many (such as those found on fences) are likely innocuous and may be left over from old banners that have long since been removed or flown away, remaining unnoticed until highlighted as an imminent threat.

Usually the result is needlessly scaring communities and wasting police resources, but in a few cases, there are more severe consequences. One recent incident led to an assault and several arrests in Hawaii.

The incident began July 7 when Kalena Hoopii, age twenty-four, entered a Home Depot in Hilo, Hawaii, and complained that she had found a white zip tie on her car in the parking

**People—particularly women—are warned to take extra precautions or call police if they find the plastic ties.**

lot, which she understood from social media warnings to be evidence that she was being targeted for abduction or human trafficking. Accompanied by a friend, Kamea-Aloha Wong, Hoopii called her boyfriend, "Mikey" Glendon, described by the *Hawaii Tribune-Herald* as a "38-year-old candidate for mayor who has twice in the past decade been acquitted on criminal charges because of mental incapacity." The three of them concluded that there must be a kidnapping ring at work in the parking lot. "All the fear in her head explodes," Glendon told the *Tribune-Herald*. "She calls me, and I'm so thankful she did." Glendon didn't call police ("Why call the cops when this shit is still going on?" he said) and instead the trio decided to investigate on their own and take action to thwart the abduction/child trafficking ring they were certain was at work in the parking lot.

After being denied access to Home Depot video surveillance, Glendon decided, "I don't need to see a video to verify it. So we run outside, block the parking lot … Because whoever's doing this is here in this parking lot. So I'm goin' block this thing and check every car and find out." All three of them blocked off exits to the parking lot and began searching for kidnappers, though it's not clear how they would be identified (perhaps by the presence of white vans or dark sedans, both common folklore themes).

As the crack team of investigators scoured the area for abductors and/or their victims, Angelo Valentino, age fif-

West Hawaii Today

Monday, Aug. 24, 2020 | Today's Paper | 76.496°

Hawaii News

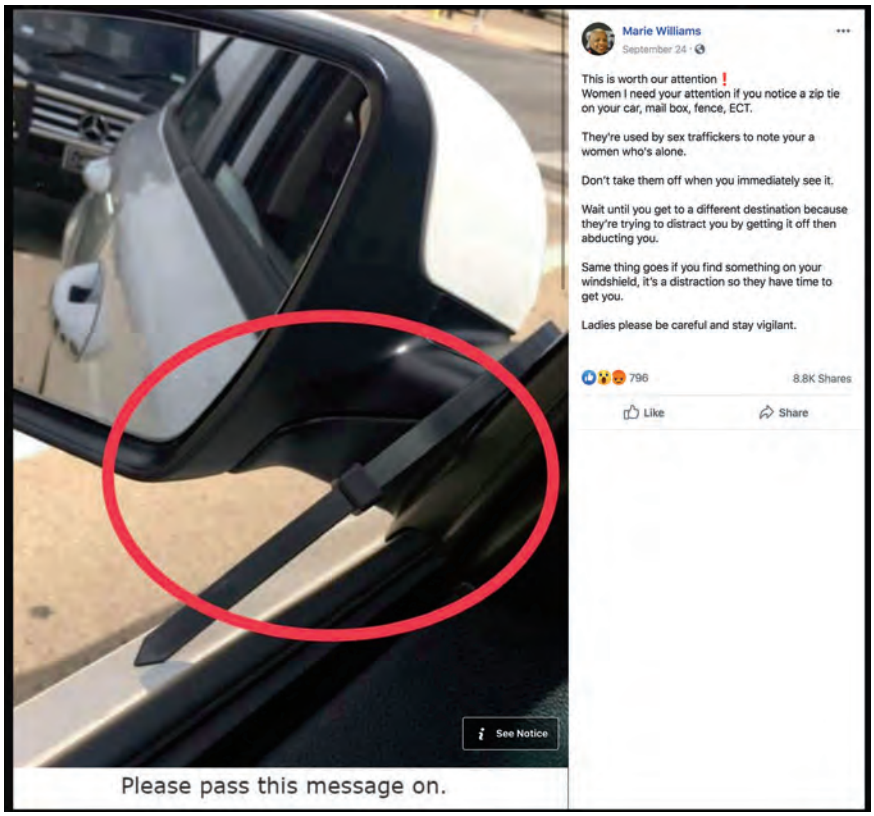
**Mayoral candidate to receive court-ordered mental examination**

By John Burnett Hawaii Tribune-Herald | Tuesday, July 21, 2020, 12:05 a.m.

Share this story

Glendon

*West Hawaii Today* reports on the arrest of "Mikey" Glendon in connection with zip tie abduction rumors.


Marie Williams
September 24 ·
This is worth our attention ❗
Women I need your attention if you notice a zip tie on your car, mail box, fence, ECT.
They're used by sex traffickers to note your a women who's alone.
Don't take them off when you immediately see it.
Wait until you get to a different destination because they're trying to distract you by getting it off then abducting you.
Same thing goes if you find something on your windshield, it's a distraction so they have time to get you.
Ladies please be careful and stay vigilant.
796
8.8K Shares
Like
Share
See Notice
Please pass this message on.

An example of zip tie abduction rumor warnings circulating on social media.

ty-five, left the Home Depot with his purchases and tried to leave the parking lot. Finding the exit blocked, he knocked on the driver's side window of Hoopii's vehicle to see what was going on. Seeing no driver or any passengers in distress, he stepped away. Hoopii and Glendon saw this from across the parking lot; as Glendon later described, "So now, we're at a point where all exits are blocked, and there's this one guy who's not from here, has an accent, *haole* [Caucasian] guy, trying to escape with his life. Instant red flag, instant common sense, yeah, to us local people."

Thinking he finally spotted a member of the abduction gang, Glendon ran toward Valentino armed with a Hawaiian shark tooth war club. Glendon and others assaulted Valentino, who was detained for the police, who arrived around 1:10 p.m. Based upon information from Glendon and others that Valentino had entered Hoopii's car and may be involved in a kidnapping ring, Valentino was arrested and taken to jail.

After further investigation and reviewing Home Depot surveillance video, the police released Valentino and issued arrest warrants for Glendon, Wong, and Hoopii. Police also determined that not only did Valentino not enter Hoopii's vehicle as claimed, no one ever saw the zip ties that Hoopii claimed to have found on her vehicle. Neither the Home Depot security guard, police, nor any bystanders reported seeing the zip ties that sparked the whole incident.

Glendon dismissed the idea that the zip tie rumors were false: "So if it's a hoax, you tell me why zip ties are on girls traveling by themselves? Hoax or not, brah, I don't take chances with my life, or my people's life, on this island." All three were later arrested on charges, including third-degree assault, second-degree unlawful imprisonment, refusing to allow ingress and egress to the parking lot, and possession of a deadly weapon.

**Most people who share viral messages warning of danger are doing so with good intentions, sincerely thinking that they may save someone's life.**

There are several skeptical themes, including conspiracies (especially of child abductions, which was the basis for the infamous Comet Pong "Pizzagate" incident in 2016). There's also the folkloric notion of warnings about gang initiations and threats (to women in particular) in parking lots and on roads. Urban legend writer Jan Harold Brunvand, for example, describes in his books many similar vehicle-related legends of gang initiations circulating for decades. One for example warns drivers not to flash their headlights at oncoming cars that have their high beams on, because there are roving gangs who pursue and kill drivers who do that as part of a "test" or ritual initiation. It's all false rumor, of course, but it still panics some to this day.

In 2018, nearly two dozen people were killed in separate incidents across a dozen Indian states when mobs set upon suspected child abductors they'd been warned about in messages on social media; see my article "Social Media-Fueled Child Abduction Rumors Lead to Killings" in the January/February 2019 Skeptical Inquirer. In many cases, minorities (especially African Americans and Muslims) have been falsely accused of abductions based on social media rumors, making it a social justice issue.

Most people who share viral messages warning of danger are doing so with good intentions, sincerely thinking that they may save someone's life merely by Liking and Sharing. Even if they don't fully believe the story, they often adopt a "better safe than sorry" approach, assuming—wrongly—that no harm can come of it. Critical thinking, media literacy, and resisting the urge to share dubious social media posts would go a long way toward avoiding these incidents.

# Why White America Must Learn the History of Lynching

GUY P. HARRISON

The aftermath of George Floyd's cruel death made it clear that many Americans are largely unaware of the history of racial lynchings in their own country. From this ignorance comes the corrosive insensitivity displayed by numerous white television pundits, journalists, radio hosts, and podcasters who comment endlessly on the details of such events and the protests they inspire with little or no attention given to *why* so many black people might have intense emotional reactions. This antagonizing disconnect between white America and black America hinders overdue progress not only on the issue of police interactions with blacks but with overall race relations as well.

Tragic incidents such as the killing of George Floyd do not occur in a vacuum for most blacks, because they are more likely than whites to be aware of the long and horrific campaign of terror waged against black people in America. Understandably, blacks tend to include this layer of historical context—thousands of racially motivated lynchings—to news of a contemporary police killing. *Anyone* who knows this part of U.S. history is more likely to react with heightened concern.

Black people were lynched with the greatest frequency and severity in the South between the end of the Civil War and 1950. Approximately 4,000 were murdered in this manner, for a regional average of close to one black person lynched per week spread over nearly nine decades. Law enforcement and other government officials consistently participated in, encouraged, or tolerated the killings. These public celebrations of torture and murder are a painful and prominent element of the black experience in America, second only to slavery. And yet much of it remains a massive blind spot for too many white people who have never learned the terrible depths and details of this nightmare.

**Black people were lynched with the greatest frequency and severity in the South between the end of the Civil War and 1950.**

In my experience, having been born and raised in the South, studied history there, and written a book about race and racism, it is not enough to know the story of Emmitt Till or have heard Billie Holiday's song "Strange Fruit." Passing glances of this sort leave too many Americans uninformed and unsympathetic to the haunting generational unease felt by many blacks today. For example, there is the common no-

tion that lynchings of the past were the work of random racist mobs run amok or well-meaning vigilante groups motivated by justice—more aberrations than a persistent pattern with a larger purpose.

The reality is that racial lynchings were a *frequent and normal feature* of life in the South. This unique method of murder was a devastating form of terrorism that imposed a constant threat to all black people. The white authority structure did not only tolerate or encourage these killings but used the fear of lynchings to control and oppress black people. Common justifications given for lynching a black person included an accusation of committing a crime, deranged fears of interracial sex contaminating the pure white race, disagreeing with a white person, looking at or addressing a white person the "wrong way," bumping into a white person, attempting to speak out or organize to improve black rights, or for simply being black. Lynchings were not only frequent and widespread in the South but also carried out with impunity. According to some research, a mere 1 percent of killers were convicted.

Even when one has studied this history, it can be a challenge to accept that it really was as bad as it was. Lynchings often were thrilling, joyful celebrations attended by entire white communities numbering in the hundreds or thousands. Refreshments and souvenirs were sold, postcards produced. Some took place on courthouse lawns or in town squares where the bodies of victims were displayed after death for all to see. White children not only watched but sometimes participated in the torture, mutilation, and burning of a victim. At home, white children often played popular lynching games with dolls or each other. Lynching was so pervasive and horrifying that it was a primary motivation for millions of black people to migrate to the North in the twentieth century, a population shift that could be described in large part as refugees fleeing for their lives. Keep in mind that this was not ancient times or the Middle Ages. This is very recent American history.

**Lynchings were not only frequent and widespread in the South but also carried out with impunity. According to some research, a mere 1 percent of killers were convicted.**

Lynchings in the past have significantly shaped race relations in the present. A killing such as Floyd's lands on black people with a much heavier psychological weight because of lynching's legacy. Too many white people fail to recognize this, and that needs to change. The hurt is too great, the simmering fear and anger too volatile, to bury forever.

All Americans who would seek or demand a nation that is fairer to every citizen, less racist, and more peaceful have a responsibility to know this history in detail. Much as I believe in the power of historical knowledge, something more than reading a book or two may be required. Perhaps an effort along the lines of a national truth and reconciliation commission would open more eyes and raise awareness. Other countries that endured similar bloody chapters in their histories have had some success with such efforts. Confronting this ugliness would be difficult for everyone, of course, but it should be attempted. Ignorance and denial certainly have not worked, because this American wound still bleeds. ■

Guy P. Harrison is the author of eight books, including *Race and Reality: What Everyone Should Know about Our Biological Diversity* and *At Least Know This: Essential Science to Enhance Your Life*. His book *Think: Why You Should Question Everything* was selected by Random House for the CommonReads and First-Year Experience programs, making it recommended reading for all first-year university students. *Race and Reality* is on the reading list for several university anthropology courses and was incorporated into a South African anti-racism program.

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# Investigating in New Zealand

In amazing sea voyages seven centuries ago, Polynesians discovered and settled the island country they called *Aotearoa*—today's New Zealand. Their descendants became the Maori people, with a distinct culture that was less nomadic, more dependent on garden food (such as gourds and sweet potatoes), and largely directed by *utu* ("reciprocity"), whether as gift-giving or by warfare. The Maoris' rich mythology includes creation myths and beliefs about the origins of natural phenomena, together with sacred lore involving various supernatural entities ("Maori Mythology" 2016).

I visited New Zealand as a side trip to my Australian investigative tour in October 2015. I spent three wonderful days in Auckland with my friend and sometimes coauthor Robert Bartholomew; his wife, Zalina; and their family. I returned not only with great memories but also with some New Zealand mysteries to share. My article "The New Zealand Moa: From Extinct Bird to Cryptid," has previously appeared (Nickell 2017). Here, I investigate three other cases.

### Sacred Volcano

New Zealand has numerous volcanoes, although none is active in the South Island. Volcanoes and other natural phenomena stirred the imaginations of the myth-making Maoris. For example, according to one legend, Lake Taupo—the country's largest lake, which occupies an ancient volcano crater—is the "beating heart" of the North Island.

Figure 1. Author at the mist-shrouded rim of the crater of Maungawhau volcano (aka Mt. Eden), a sacred place in Maori tradition.

Among the volcanic mountains around Lake Taupo, three are the subject of an engaging Maori legend: Taranaki (aka Mount Egmont), Tongariro (a compound volcano with as many as twelve cones), and Pihanga. The legend tells how the latter's beauty caused the others—both warrior mountains—to fight for her love. Their anger made the earth tremble, and their fierce combat produced great smoke and fiery eruptions, until at last Taranaki lost the combat. Defeated, he moved away to where he now stands, near New Plymouth. His movement west left a great gouge in the earth that filled with his tears, becoming Whanganui River ("Volcanology" 2016; "New Zealand's" 2016).

In the Auckland area off the east coast, I viewed scenic Rangitoto Island, a symmetrical volcanic cone, and visited Mount Eden, or Maungawhau, as it is known to the Maoris. Walking along its rim (Figure 1), I encountered a sign prohibiting entering the crater, which was described as a "fragile and sacred area." The word *sacred* lingered in my mind, and I wished to know more about the special status of the volcano.

I learned that the Maoris called the crater itself "the bowl of Mataaho." He was a Maori deity, the god of secrets that are concealed in the earth. According to legend, Mataaho was indirectly responsible for other volcanoes of the region. When Mataaho's wife left him, taking his clothes (a charmingly human concept!), the goddess Mahuika saw his need and sent fires to warm him ("Story: Tāmaki tribes" 2020).

From then on, a Northland Peninsula tribe continued to take care of Mataaho. For him, they left their best offerings, placing them in the center of the crater, that is, "The bowl of Mataaho." For the Maori, the site is a *taonga*—that is, a treasure, such as an heirloom or memory or spiritual belief. Mataaho's bowl is all of these, a sacred place.

Enduring myths such as these supernatural accounts of the natural are not merely the products of tribal raconteurs. While not science, they are attempts—intertwined with religion—to explain the mysteries of the Maori world. For us, they also provide insights into the ways in which human thought inter-

prets experiences, whether involving natural phenomena or social customs. As a poet, I find them especially resonant.

### Water Monsters

Among the fearsome creatures of Maori tradition are the *taniwha* (pronounced ton-e-fah in Maori). These monsters were analogous to dragons in certain other cultures. They lurked in the deep pools of rivers, lakes, oceans, and caves. Some tribes believed them to be their guardians, offering the creatures gifts and addressing them with incantations. To others, however, they were fearsome beings that kidnapped women or killed and even ate people.

The monsters had various forms. Some resembled giant lizards—with or without wings. Some were reptilian sea creatures, while others looked like whales or large sharks, and still others appeared in the form of floating logs in rivers. (More on this image presently.) Some taniwha were even shapeshifters. Here is one legend:

> The taniwha Tutaeporoporo began life as a shark. A chief caught him and kept him as a pet in a river. Then Tutaeporoporo changed, growing scaly skin, wings, webbed feet and a bird-like head. He began eating people traveling on the river. To catch him a taniwha slayer, Ao-kehu, hid inside a hollow log in the river. The taniwha smelt him, and swallowed the log. Slashing his way out of the taniwha's stomach, Ao-Kehu soon killed him. Inside the taniwha were the remains of people and canoes that he had eaten. ("Taniwha" 2016a)

In Auckland I visited Hotunui, the great meeting house of the Hauraki, a Maori tribal people. Built in 1878 and now entirely preserved in the Auckland Museum, it bears on a side wall an elaborately carved wood figure of Ureia, a sea monster and guardian of the Hauraki. It is rendered with a serpent-like body, in the style of Marakihau, a deep-sea-monster type of taniwha.

According to legend, Ureia was lured by the Waikato people to their fishing settlements on the north shore of Manukau Harbour. There they caught his head in a snare they had set and, in his efforts to free himself, he heaved the waters for two days, before dying. This cheered the 1,000 exhausted warriors, ranged on either side of the harbor, who had to keep the snare ropes taut all the while. "To this day," the story concludes, "one often sees the waters of Piponga Point heaving and boiling just as they did when Ureia was snared there" ("Ureia" 2016). Of course, myth aside, the roiling is due to other factors, such as gusting winds and playing seals that are common to those waters.

**Myth aside, the roiling is due to other factors, such as gusting winds and playing seals that are common to those waters.**

The highly stylized carving of Ureia indicates that it has become a fully mythologized figure, far from a realistic depiction of whatever real creature may have been snared long ago at Puponga Point, assuming an actual event is related in the folktale. If not, it may nevertheless evoke similar events involving Maori warriors.

Even if we suspect that taniwha grew gigantic and changed shape only in colorful Maori legends, nevertheless the tales may have been inspired by actual creatures. Recall, for example, that Tutaeporoporo "began life as a shark." Human remains (along with inedible objects) have indeed been found inside tiger sharks (Pleasance 2016), which inhabit New Zealand coastal waters. This shark has come to be called a "garbage eater" and can attain a length of over sixteen feet. In the Pacific Ocean, it ranges as far south as New Zealand, sometimes leaving deep water for shallow channels ("Tiger shark" 2016).

It can hardly be a coincidence that *taniwha* derives from the Proto-Oceanic word *tanifa*, "Shark species," or that the Tongan and Niuean *tenefa* describes a great shark, as does the Samoan *tanifa*. Although in the Tokelauan language *tanifa* describes a man-eating sea monster, most of the other Polynesian languages have cognates that mean "shark" or even just "fish" ("Taniwha" 2016b).

Again, especially fearsome taniwha may simply have been the distorted and mythologized folk memories of the western Pacific or Asian crocodile ("Animals" 1966). Appearing like a log that could suddenly transform itself into a ferocious, man-devouring monster, and having reptilian, even dragon-like features, the crocodile is the likely real-life creature behind some Maorian taniwha narratives.

As to the taniwha's guardian aspect, consider the true story of Pelorus Jack, a dolphin that became famous for meeting and accompanying ships in the area of Cook Strait for nearly a quarter century, from 1888 to 1912. The world's first dolphin to be given legal protection, Pelorus Jack was believed by Maoris to be a guardian taniwha named *Tuhirangi* who had taken the form of a dolphin ("Taniwha" 2016a; "Rare" 2016).

Cryptozoologists (those who study "hidden" animals such as Bigfoot and the Loch Ness monster) are naturally interested in the taniwha, one of which created a sensation in 1887 at New Zealand's Raglan Harbour. It had reportedly "cleared carcasses out of slaughter houses, chased children, left peculiar tracks, etc.," but Maoris found it on the beach and shot it. It was eleven feet long, and from details of its appearance—hair coat; pectoral and tail fins; eight pairs of teeth in each jaw, "four of them [the canines] being like tusks"; and lack of external ears—it was "supposed to be a sea elephant" ("The Waikato" 1887).

To be more precise, it was a Southern Elephant Seal. I suspect that at eleven feet—because females are typically shorter (only eight-and-a-half to almost ten feet long), whereas males are larger (in the fourteen- to nineteen-foot range ["Southern" 2016])—the "monster" was a juvenile male.

Considering all the evidence regarding the taniwha, we may well ask whether they are mythical or natural creatures! The answer is yes.

### Parnell Outbreak

Speaking of New Zealand coastal

waters, a more modern case involved nothing so exotic as a sea monster but rather something quite the opposite: a mundane cargo ship with the placid name *Good Navigator*. Still, the case is quite instructive, related to me by Bartholomew. It is included in his book (coauthored with Peter Hassall), *A Colorful History of Popular Delusions* (2015, 141–146). He first sketched the story for me on a visit to the original site on October 24, 2016.

Bound for Sydney, Australia, the *Good Navigator* had left a Mexican port on January 26, 1973, but by February 10, some of the fifty consigned drums of a chemical it was carrying became damaged when the vessel endured fierce winds and rough water. It was consequently diverted to Auckland, arriving on February 26. At once, wharf workers encountered a sickly, sweet smell and balked at unloading the cargo. They relented after being issued protective suits and respirators, along with extra wages. The resulting two truckloads of drums were stored at a temporary waterfront site at Parnell.

Soon, however, the odor spread into the inner city, resulting in a four-block area being evacuated. By the next afternoon, a larger area was cordoned off, and "Parnell had effectively become a ghost town," noted Bartholomew and Hassall (2015, 142). Then:

> On the morning of February 28, the Parnell fumes scare dominated the news with dramatic headlines. Four thousand people had been evacuated. Hundreds have been treated for symptoms—half at Auckland City Hospital and half on-site by ambulance staff. In all, twenty-three streets were evacuated, and many residents from young children to the elderly were temporarily housed at the Pitt Street Ambulance Station in central Auckland City. The feelings of most were probably summed up by ninety-five-year-old Mrs. N.A. Ha'ul: "All I want to do is to get back to my room, but they won't let us yet. It is not safe." An elderly couple—a Mr. and Mrs. Carlton, were the first locals affected. Many people, including police and firemen, felt ill and were rushed to the hospital.

The spreading evacuation and shop closings brought still more people complaining of such symptoms as headaches and nausea, tightening of the chest, weakness and fatigue, and soreness of eyes.

A psychiatrist from Auckland University, R.W. McLeod, soon brought some sense to the situation. Because the captain and crew had known of the leaking drums because of the smell but themselves suffered no adverse effects over a two-week period, McLeod came to question the nature of the outbreak. The fact that some persons who remained in the area were not affected, along with numerous pets, served as corroborative evidence that, as McLeod (1975) concluded, the episode was an outbreak of mass hysteria, heightened by confusion over exactly what was in the container.

In fact, it was a light, oily chemical called Merphos (butyl mercaptan), commonly used both as a pesticide and a defoliant. Of course, the chemical is highly toxic, but the *Encyclopedia of Toxicology*—citing the very case we are discussing—questioned whether there was a causal relationship between the exposure and the reported symptoms. Indeed, "the incidence and severity of the physical symptoms in individuals exposed to mercaptan-containing air pollution were not proportional to the intensity of the odor but rather to the emotional response that it induced." The encyclopedia's entry on mercaptans noted that the 1973 incident in New Zealand had been "reevaluated, with a diagnosis of mass hysteria" (Munday 2005).

* * *

As diverse as these brief studies are, they nevertheless illustrate the power of imagination—often at the expense of rational, scientific thinking—regarding emotionally held beliefs. They therefore should not be dismissed but carefully studied to understand the lessons they can teach. ■


### Acknowledgments

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Massimo Polidoro is an investigator of the paranormal, lecturer, and cofounder and head of CICAP, the Italian skeptics group. His website is at www.massimopolidoro.com.

# Atlantis under Ice? Part 1

Atlantis is seen by many as the lost civilization *par excellence*, the "mother" of all civilizations. It is a pity that, despite much searching of the Mediterranean Sea and the Atlantic Ocean for the mysterious island described by Plato, nothing convincing has ever been found. Neither unknown submerged archaeological remains nor sunken continents have been unearthed. Could it not be, some have wondered, that Atlantis did not end up under the sea at all but still exists somewhere else? And maybe we cannot see it because it is hidden in plain sight? This is the opinion of those who believe that Antarctica was in fact once free of ice and is where the ancient lost civilization can be found.

### Something Strange

It all began in the mid-1950s with the observation of a scholar of ancient maps, Captain Arlington H. Mallery. Mallery had a revelation upon examining a map discovered a few years earlier in Turkey. The map, created in 1513 CE by the Turkish Admiral Piri Ibn Haci Mehmet, better known as Piri Re'is, was drawn on a gazelle skin treated and colored in watercolor. It was also lost for over 400 years. In 1929, during the transformation of the old Istanbul Imperial Palace into today's Topkapi Archaeological Museum, the map reappeared. It caused surprise, because it placed South America in the correct longitudinal position in relation to Africa—an unusual feature for sixteenth-century maps.

What struck Mallery, however, was something else. In fact, he was convinced that the strip of land depicted in the extreme south of the map represented the coast of Antarctica free from ice. Subsequently, scholar Charles H. Hapgood hypothesized that the accuracy of the longitude on the Piri Re'is map could not be explained on the basis of the sixteenth-century science of navigation. In particular, Hapgood claimed, there was "a surprising concordance with the seismic profile of the Earth of Queen Maud in Antarctica" detected only in 1954 through seismic surveys (Hapgood 1966). It followed that the map had to be based on older maps made by travelers of an unknown but advanced civilization that existed before the Ice Age.

Although noted writers such as Rand and Rose Flem-Ath and Graham Hancock wrote bestsellers in the 1990s hypothesizing that this unknown civilization was Atlantis, an Italian engineer beat them to the punch. Flavio Barbiero first mentioned the hypothesis in 1974 in his book *A Civilization under Ice*.

### Universal Cataclysm

Barbiero's theory starts from the hypothesis that about 12,000 years ago, Earth was tilted differently from how it is today. It rotated perpendicular to the ecliptic plane, so the seasons stably coincided with the climatic bands. Alaska and Siberia, as well as Antarctica, were ice-free, and their climate was mild. This contrasted with Europe and Northwest America, which were covered by polar ice.

Barbiero's theory continues that in Antarctica in particular, a very advanced marine civilization flourished, in which metallurgy had been invented and architecture, technology, art, and high-level science flourished. Meanwhile, in the rest of the world man was still in the Stone Age. Ten thousand years ago, after about 2,000 years of progress, this civilization called Atlantis suffered a devastating catastrophe that almost completely annihilated it. A comet or asteroid about six miles in diameter struck near Florida, causing a series of almost instantaneous global transformations.

The Earth's axis of rotation changed; the poles suddenly moved thousands of miles to where they are today. The impact raised a cloud of dust that triggered torrential rains, with the consequent lowering of temperatures and the start of the great glaciation. The cooling was so fast that it took the great mammoths grazing around Siberia by surprise, as evidenced by the fact that in the stomach of a specimen found there were still the remains of the last meal of vegetation from the temperate zones. It had frozen without having had time to decompose. But the most devastating effect was the cyclopean wave caused by the impact of the fireball. This wave would have engulfed all lands, including Atlantis-Antarctica.

Barbiero hypothesized that thanks to its fleets of massive ships, part of the population of Atlantis managed to escape and reach America, Africa, and Asia. Meanwhile, on the mother island, it began to snow for weeks or perhaps even months, until a frozen blanket, many meters thick, finally buried Atlantis along with all those who had not managed to escape to safety. The survivors, scattered around the world, began to interact with the Paleolithic locals, teaching them to cultivate the fields and accelerating the development of civilization, thus suddenly originating the Neolithic age.

**Barbiero hypothesized that thanks to its fleets of massive ships, part of the population of Atlantis managed to escape and reach America, Africa, and Asia.**

### The Evidence

The theory is very fanciful and elaborate, so one wonders: Where is the evidence? First, Barbiero contends as proof the sudden disappearance of dozens of animal species that populated the northern hemisphere 12,000 years ago: mammoths, mastodons, woolly rhinos, reindeer, ancient bison, horses, camels, saber-toothed tigers, and so on. What other than a sudden glaciation, which came within a few days after the sudden shift of the north pole, could have caused such a massacre?

As more proof, Barbiero offers the great similarities between myths and legends of peoples around the world, from the Bible to Mesopotamia, from the myth of the island of Mu in North America to the Incan myth of Viracocha. Each contains a flood that overwhelms the world and then someone who comes from the sea and teaches how to cultivate the land. These legends could be clear proof that the memory of the phenomena following the change of Earth's axis has remained deeply rooted in the memory of the peoples. Other legends spread everywhere could tell us that the celestial body that hit Earth was probably a comet. Just think of ancient superstitions of comets as messengers or carriers of serious calamities and the atavistic fear that still takes hold of us whenever some unusual astronomical event occurs.

As for his belief that Atlantis can only correspond to Antarctica, Barbiero acknowledges that "nowhere archaeological remains have been found. A civilization of that size, in Europe for example, would have left ample traces" (Barbiero 1974). Then he reasons that because Atlantis was such a huge civilization, and we have not found any traces of it (he admits there should have been traces somewhere), then those traces *must* be hidden somewhere. Where? "Obviously" under the ice of Antarctica! Also, in his view Antarctica is the only continent that reflects Plato's description: an island with an area of millions of square kilometers, surrounded by an ocean in turn surrounded by a continuous strip of continents, rich in metals and favored (before the flood) by a mild climate. As further proof of this, Barbiero maintains that "all the planispheres prior to the discovery of America are actually manipulated maps of Antarctica: all ancient peoples conceived the world as a large, almost circular island, surrounded by the ocean, and this in turn from distant, unreachable and mysterious lands" (Barbiero 1974). For example, looking at the planisphere taken from the "Grandes Croniques" of Saint Denis (1364–1372), Barbiero recognizes "the Ross Sea on the top right, the Mackenzie Bay on the left and the Weddell Sea below" as well as the "thick network of channels similar to that described by Plato" (Barbiero 1974). Not to mention the Piri Re'is map, which would reproduce the profile of Antarctica without its ice cover. According to Barbiero, it is clear that all these medieval maps derive from older maps, perhaps from the library of Alexandria before it was destroyed.

It is all very suggestive, in theory, but where are the facts? Just a single brick or item from Atlantis would be enough, but does it exist? This is what we shall see in the second part of this series. ■

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**[ REALITY IS THE BEST MEDICINE** HARRIET HALL

Harriet Hall, MD, also known as "The SkepDoc," is a retired family physician, a CSI fellow, and an editor of the Science-Based Medicine blog. Her website is www.skepdoc.info.

# Restricting Freedom, from Typhoid Mary to COVID-19

We are seeing a lot of pushback on government restrictions imposed to limit the spread of COVID-19. Many people refuse to wear masks or practice social distancing. Some claim that the disease has been conquered, pointing to improvement in survival rates, and manage to ignore the increasing number of new infections and hospitalizations. Some continue to believe that the disease is nothing more serious than a mild flu. They deplore the disastrous effect of restrictions on the economy. Some even refuse to accept that there is a pandemic at all. Businesses are closing; people who have lost their jobs are applying for unemployment benefits; people who can't pay their rent are being threatened with eviction. Some even claim that their First Amendment rights are being violated. Conspiracy theories are rampant, including the bizarre idea that Bill Gates introduced the virus with the intention of using a resulting vaccine to implant microchips so he could control everyone. Distrust of scientists and government officials is more and more widespread.

### Typhoid Mary

Protests like this are nothing new. They date back to the 1918 flu epidemic and even earlier. Typhoid Mary had far more reason to protest that her rights had been violated. She was not allowed to work as a cook, and she was locked up and kept in isolation for nearly three decades.

You have probably heard of Typhoid Mary. My daughter recognized the name as that of a fictional supervillain in Marvel comics. But Typhoid Mary was very real, and her story is instructive.

Mary Mallon was born on September 23, 1869, in Ireland. She may have been born with typhoid because her mother was infected during pregnancy. She never had symptoms of typhoid infection; she was an asymptomatic carrier of the bacteria. She migrated to the United States at age fifteen. She first worked as a maid and then was employed as a cook. She worked for a series of well-to-do families in the New York area between 1900 and 1907. In one household, seven out of eight family members quickly became

## Helpful Definitions

**Shelter in place**: seek safety in the building you already occupy rather than evacuating.

**Social distancing**: keep a safe distance between yourself and others, usually around six feet.

**Isolation**: separating sick people from people who are not sick.

**Quarantine:** restricting the movement of people who may have been exposed to a disease while waiting to see if they will become sick.

ill with typhoid. In a seven-day period after she started to cook for a family in Long Island, six of eleven members of the family were diagnosed with typhoid fever. She changed jobs frequently, and everywhere she went illness and death followed. Mary was identified as the source of the infections after Charles Warren's only daughter died of typhoid fever. Mary refused to cooperate, refusing to believe she could be responsible, claiming that the outbreaks must have been caused by contaminated food and water. The concept of a healthy carrier was not yet recognized, and she never believed she was a carrier.

After an investigator named George Soper identified Mary Mallon as a carrier of typhoid, she was arrested and quarantined. It took five policemen to get her into the ambulance, and someone had to sit on her to restrain her. She admitted that she almost never washed her hands. She protested loudly, tried to sue the New York Health Department, and suffered a nervous breakdown. Three years after she was quarantined, New York State Commissioner of Health Eugene H. Porter released her after she agreed to stop working as a cook and take precautions to avoid transmitting typhoid to others. After several years of failing to earn a decent living with other occupations, she resumed cooking again using fake names, moving frequently, not giving a forwarding address, and refusing to cooperate. Everywhere she went, there were outbreaks of typhoid. She may have caused as many as fifty fatalities. She tried to evade arrest, but the police eventually found her and quarantined her for a second time in 1915. She remained isolated for the rest of her life. The typhoid bacteria were carried in her gallbladder, but she refused the gallbladder surgery that might have cured her. She was forcibly treated with a series of medications that were ineffective and had side effects. She had a stroke in 1932 that left half of her body paralyzed, and she died of pneumonia in 1938 at age sixty-nine. Only nine people attended her funeral.

Typhoid Mary was the first asymptomatic carrier to be forcibly isolated. Her personal rights and liberty were violated to save lives. By the time of her death, 400 other healthy carriers of typhoid had been identified, but no one else was forcibly confined. There was controversy over her punishment; some doctors thought isolation was too severe and that she should have been taught to manage her condition to avoid infecting others.

### The History of Quarantines

Pandemics are a public health emergency. If no action is taken, huge numbers of people will die. The Black Death pandemic killed up to 40 percent of the population in some countries. The 1918 influenza pandemic killed fifty million people around the world. There are many precedents in history where quarantine was imposed to prevent the spread of disease. The Bible describes procedures for priests to isolate patients for skin lesions (probably leprosy). For Muslims, the prophet Muhammad advised quarantine for those with contagious diseases. In Medieval Europe, lepers were isolated from society. During the Black Death, new arrivals were required to live on islands or other restricted places until it could be established that they were not infected. The term *quarantine* is derived from a Venetian word meaning "forty days." Venice required a forty-day period of isolation for ships and people to prevent the Black Death from spreading.

Throughout the nineteenth century, most Western countries imposed strict rules to control the spread of contagious diseases during epidemics of yellow fever, cholera, smallpox, and plague. The Ottoman Empire enlisted the army to control borders and monitor disease. During the 1918 influenza epidemic, governments instituted isolation and surveillance and closed schools, churches, theaters, and public events. International conventions developed guidelines that countries could agree on.

In 2007, Andrew Speaker was involuntarily isolated because he was thought to carry multi-drug-resistant tuberculo-

sis and had been traveling extensively. Several state governors responded to the Ebola outbreak by imposing mandatory three-week quarantines for patients who had been in contact with Ebola patients. When Kaci Hickox returned to the United States after treating Ebola patients in Africa, she was quarantined in a medical tent; she filed suit, claiming she had been treated inhumanely. Soldiers returning from Operation United Assistance in Liberia in 2014 were ordered into quarantine by the U.S. Army Chief of Staff. Public fears led to overreactions. Some schools were closed, and a principal in Mississippi was forced to take personal vacation time because he had traveled to an African country that had no Ebola cases. Some schools denied admission to students from Africa, and universities canceled speaking engagements for people who had traveled to Africa.

Anti-mask signage at rally. Source: Tim Dennell / Flickr

**COVID-19 Restrictions**

Countries have responded to COVID-19 in different ways. Those that quickly implemented masks, social distancing, frequent hand washing, testing, and contact tracing were most successful in limiting the spread of the disease. Those methods *work*. Their efficacy is no longer open to question by rational people who acknowledge the evidence. But some rational people still question whether it was necessary to devastate the economy to save lives. Was the cure worse than the disease? It appears that it probably wasn't. An economic analysis estimated that public health measures would save between 900,000 and 2.7 million lives in the United States by the end of 2020, whereas the effects of the economic downturn could contribute to between 50,400 and 323,000 deaths. The numbers are staggering, but consider the individual. If you lose your source of income and are unable to visit your dying mother in the hospital, you will feel a direct impact; if your life is one of the ones saved, you may never know.

**Objections to Masks**

We wear masks mainly to protect other people. Masks will help reduce the risk that infected but asymptomatic people may infect others. They also reduce the risk to the wearer, but to a lesser degree. They are not meant to offer complete protection. Dr. Steven Novella's advice is excellent: wear masks in public but learn to wear them properly, and act as if the mask does not work. Some people claim they can't breathe with a mask on. That's nonsense, considering operating room personnel wear masks all day every day, and they breathe just fine with no ill effects.

Some falsely claim that masks are killing people and compare public health measures to the Nazi's treatment of the Jews. Some refuse to follow public health guidelines because they are young, healthy, and think they are safe. Some are just contrarians who don't want any authority to tell them what to do. Some claim that their First Amendment rights are being violated, but that's not true. They are not prevented from practicing their religion; the restrictions only make it safer to do so. Their right of peaceable assembly is not infringed upon as long as they maintain social distancing. Their right to vote is not infringed upon; most states have vote-by-mail options, and there's no reason it couldn't be offered in all states. The government is obligated to promote the common welfare. That's the purpose of quarantine. There is nothing in the Constitution that gives citizens the right to ignore public health measures. Citizens have rights, but they also have responsibilities. One of them is not knowingly spreading contagious diseases.

In short, governments can issue recommendations or can impose quarantines using regulations or physical coercion. They must weigh the impact on the common welfare of controlling contagious diseases against the impact on the common welfare of the economic consequences. This is not an easy decision. Science can inform us about facts and evidence, but it can't tell us what we *should* do. Society as a whole has to make choices, and so do individuals. Individuals have to consider fear, altruism, and their tolerance of inconvenience. When I see someone not wearing a mask in public, it suggests to me that they don't value science or care about others and are guided by emotion rather than by reason. They want to make an emotion-based political statement. When I see someone wearing a mask, I think, "Thank you for protecting me." ■

**[ BEHAVIOR & BELIEF** STUART VYSE

Stuart Vyse is a psychologist and author of *Believing in Magic: The Psychology of Superstition*, which won the William James Book Award of the American Psychological Association. He is a fellow of the Committee for Skeptical Inquiry.

# COVID-19 and the Tyranny of Now

Back on March 13, 2020, I invited a few friends over before we all went into lockdown. We did not stay six feet apart—the norm of social distancing had not yet been fully absorbed—but in a nod to good hygiene we washed, used disinfectant, and avoided shaking hands or hugging. That evening of food and drink was the last time anyone other than me has been in my living space.

At that time, restrictions were just beginning to roll out. Two days later, our governor closed schools for a two-week period, and the CDC recommended against gatherings of fifty or more over the following eight weeks. It would be another week before all nonessential businesses were closed in our area. That evening, we were all in a state of shock and unable to process what was happening. One of my friends turned to me and asked, "Do you think we will be back to normal in April?"

I'm the kind of person who copes with bad news by doing as much as I can to understand it. By Friday the 13th of March, I had already been obsessively reading about the new coronavirus for a couple of weeks. I had already heard Harvard epidemiologist Marc Lipsitch's estimate that 40–70 percent of the world's adult population could be infected and that 1 percent of symptomatic people could die (Axelrod 2020). I'd also heard about the difficulties in developing vaccines. So, I said to my friend, "No. I think life is going to be different for a long time."

In the subsequent months, we all went through a difficult process of accepting the loss of normal life. Much has happened since those early days, and people are now understandably frustrated and anxious to gather together again in all the usual places. Even more urgent were the cries of parents who were at home trying to work and raise children at the same time or, worse, needed to leave home for work without the benefit of face-to-face school or childcare for their children. Households with children at home have also suffered the greatest economic impact of the pandemic (Armantier et al. 2020).

All of this tends to make people impatient—and for good reason. Whenever there is a gap between where we are and where we want, expect, or used to be, people get desperate, and that gap has never been so large in most people's lives as it is right now. Unfortunately, the impatience of these desperate times can lead to serious mistakes.

### The Tyranny of Now

Many of humanity's worst problems are caused by what could be called the *tyranny of now*. Smaller rewards in the present are chosen over larger ones in the future. The most obvious example is climate change. Many decisions made out of convenience today are quickly guiding us toward an

uninhabitable planet tomorrow. In the area of health, we often enjoy tobacco, drugs, alcohol, and caloric foods at the expense of good health in the future. In our economic lives, we buy things with a credit card, paying more later to have something now. The list goes on. It appears that *Homo sapiens* evolved in environments that gave great value to immediate rewards and punishments—the veritable bird in the hand. Unfortunately, as we have expanded our ability to alter the future, we have not adequately adjusted our relationship with the now.

The coronavirus pandemic has exposed many examples of this kind of short-term thinking. Delayed effects have been given less weight than immediate ones, sometimes with deadly results. Here are just a few examples.

Source: Pixnio (https://pixnio.com/media/bicycle-crowd-face-mask-gloves-gorgeous)

### Delayed Effects of Public Health Interventions

One of the most frustrating aspects of the fight against SARS-CoV-2 has been the imposition of substantial changes in our lives, only to have to wait for weeks to see any benefit of our sacrifices.

In the case of New York State, the governor ordered a statewide lockdown on March 22, but New Yorkers had to wait nineteen days until the number of new cases began to fall and two full months—until May 23—before the number of daily cases fell below what they were on the first day of the lockdown. Fortunately for New Yorkers, daily COVID-19 fatalities, which reached a peak of 1,025, began to fall just days after the new cases curve bent downward.

As the pandemic progressed, another, more confusing effect of delays emerged in the United States. In mid-June, after having maintained a rate of approximately 20,000 new cases per day, new infections began to rise. The lockdowns that had been in effect in the West and especially the Northeast had greatly diminished the number of new cases in those areas, but in June and July, states in the South and Midwest that had been largely spared began to show increasing levels of infection. This ripple effect created conflict—or what seemed to some to be a conflict—between the new cases curve and the death curve.

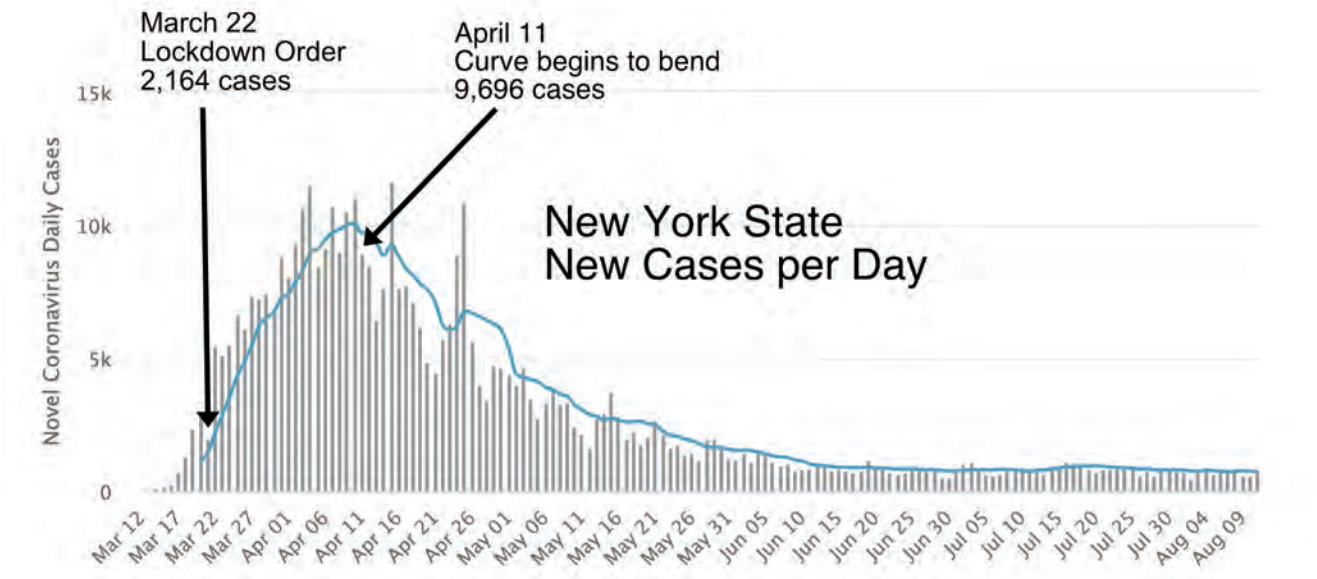


Figure 1. New cases of the novel coronavirus per day in the State of New York. The blue line is the seven-day moving average. (Source: Worldometer)

At the national level, cases were back on the rise, but deaths continued to fall. President Donald Trump blamed the increase in cases on increased testing, and at his ill-fated rally in Tulsa, Oklahoma, on June 20, he acknowledged "I asked my people to slow the testing down, please" (Vazquez 2020).

When you get a mix of good news and bad, it is natural to accentuate the positive, and in 2020 we are desperate for anything positive. In addition, there is still much we don't know about SARS-CoV-2, and our lack of knowledge provides cognitive wiggle room for optimistic speculation. Of course, if you are a politician, you have an even stronger incentive to push positive news. In June and July, some people suggested that the original form of the virus was mutating and becoming less lethal (Woodward 2020). Vice President Mike Pence tried to paint a rosy picture by pointing out that a larger percentage of the infections were in younger people, who were less likely to develop serious symptoms. On July 6, the president claimed success based on the lower death rates, but speaking a day later, Dr. Anthony Fauci, the nation's top infectious disease expert, said it was a "false narrative to take comfort in a lower rate of death" ("As Coronavirus Cases" 2020). As early as late June, Fauci pointed out that deaths lagged weeks behind infections and predicted that the country would soon be seeing more deaths (Feuer 2020).

Undeterred, a number of southern governors continued to open their states despite rising infections. By July 9, daily infections in Florida had quadrupled over recent weeks, but deaths had not yet started to rise. As a result, Governor Ron DeSantis, echoing the president, claimed that additional testing had caused the rise in confirmed cases, and he pressed for the schools in his state to open (Klas 2020). On July 16, as infections were soaring in Georgia, Governor Brian Kemp sued Atlanta to stop the city from mandating the use of masks in public settings (Bogel-Burroughs and Robertson 2020). But, as should have been expected, Fauci was right. By August 1, U.S. deaths from COVID-19 had surged back up to over a thousand a day.

### Bars and Restaurants before Schools

When states under lockdown orders had driven the infection rate low enough to consider reopening, another example of short-sighted reasoning took hold. In an unfortunate bit of timing, the move to reopen occurred after most schools had already closed for the year. People were anxious to go out, and much attention was placed on reopening bars and restaurants. For example, Indiana began to reopen on May 1, but schools remained closed (*Washington Post* Staff 2020). On May 11, indoor dining at restaurants reopened at 50 percent capacity, and on June 12, as the state entered its Phase 4, restaurants opened to 75 percent capacity. Bars, nightclubs, movie theaters, and bowling alleys opened at 50 percent. But after bottoming out at a seven-day moving average of 297 new cases per day on June 24 (Wordometer.com), infections began to rise sharply. By mid-August, the seven-day average of new cases in Indiana was at 935, over three times what it had been two months earlier and 25 percent higher than the peak during lockdown. On August 1, the governor introduced a statewide mask mandate for the first time, but by then school openings were close at hand (Kemp et al. 2020).

Of course, there were economic reasons to open bars and restaurants, but there are arguably even greater economic and social reasons to open schools. Furthermore, some of what happened after the reopenings might have been predicted. Back in May, 119 new infections were traced to one patron who visited several bars in a single night in Seoul, South Korea (Dennett 2020), and today reports are coming in from the United States suggesting that restaurants and bars are an important source of new cases. In an August 12 article titled "The Nation Wanted to Eat Out Again. Everyone Has Paid the Price," the *New York Times* reported—in a quote that could sum up the main point of this column—"short-term gains have led to broader losses" (Steinhauer 2020). States throughout the country have tracked a substantial portion of new cases of SARS-CoV-2 to restaurants and bars.

I am fortunate to live in Connecticut, a state that currently has one of the lowest rates of infection in the country. As I write this, schools in my area are making plans to return to some form of in-person instruction, and as is true all over the country, it is impossible to predict how well the school openings will go. But it is much easier to think about sending your child back to school in a state, like mine, that is averaging seventy-two new infections per day and has a test positivity rate of less than 1 percent (Johns Hopkins University n.d.), than it would be, for example, in Indiana, where they are currently averaging over 900 new infections a day and have a test positivity rate of 9 percent. Indiana's population is approximately two and a half times that of Connecticut, but adjusting for population does not do much to close the virus gap between the two states.

School openings will be another big test of our national, state, and local responses to the coronavirus crisis, and by the time this column is printed, we will have the benefit of hindsight. At that

Donald J. Trump
@realDonaldTrump
Why does the Lamestream Fake News Media REFUSE to say that China Virus deaths are down 39%, and that we now have the lowest Fatality (Mortality) Rate in the World. They just can't stand that we are doing so well for our Country!
4:17 PM · Jul 6, 2020 · Twitter for iPhone

Source: Pixabay

point, we can take stock of how much we paid later to go to bars and restaurants earlier.

### Clinical Trials and the Tyranny of Now

As described in an important *New York Times Magazine* article by Susan Dominus (2020), some of the most dramatic examples of the tyranny of now have been playing out in intensive care units throughout the country. At the beginning of the epidemic, doctors knew almost nothing about this disease and how to treat it. They gave basic supportive care—oxygen, hydration, antibiotics, and ventilation—but they had no idea what therapeutic drugs might be effective in treating hospitalized COVID-19 patients. ICU doctors were overwhelmed, stressed to their limits, and desperate to do something for their COVID-19 patients. Based on informal reports of other doctors' experiences, both here and abroad, many physicians tried "off label" uses of drugs that had been approved for other conditions and were considered safe. At the same time, a variety of double-blind randomized control trials (RCTs) were launched to test drugs that seemed promising. At the height of the outbreaks in New York and New Jersey, ICU doctors were well aware of the on-going RCTs, but each time they prescribed a therapeutic drug for their patients, they eliminated a potential participant from studies that could establish which drugs were actually effective.

The case of the antimalarial drug hydroxychloroquine was particularly instructive. In March, President Trump started praising the effectiveness of hydroxychloroquine, and that same month, the Food and Drug Administration approved it for emergency use with COVID-19 patients. Unfortunately, the excitement about the drug was largely based on a small study done in France that was not sufficient to convince most scientists. In the hope of providing a more definitive test, Steven Libutti, director of the Rutgers Cancer Institute of New Jersey, got approval to start a larger RCT, but he found it difficult to enroll patients in the study. As Dominus reported, by the time a nurse spoke to patients about participating in the RCT, most had already taken hydroxychloroquine, making them ineligible for the study. In the end, England was the first country to produce a good test of hydroxychloroquine because their doctors had been instructed not to use it until more was known about it. The results: hydroxychloroquine was not found to be effective in the treatment of COVID-19.

The plight of ICU doctors is quite understandable. Many have extensive experience and are likely to rely on their clinical judgment in difficult cases, but decades of research have shown that physicians sometimes make predictable decision errors (Redelmeier et al. 2001). During the current pandemic, doctors have also had to contend with patients' families, many of whom had heard the president praising hydrochloroquine and were anxious to have it prescribed for their loved ones. Finally, being in an RCT means understanding that you have a chance of being assigned to the placebo group. The only way to prove a drug works is to compare it to a group of similar patients who get an inactive placebo.

In August 2020, in the Center for Inquiry's Skeptical Inquirer Presents series, Dr. Paul Offit, pediatrician and expert on vaccines, said that to test a vaccine for COVID-19, it would be necessary to have approximately 150 people in the placebo group who eventually come down with the disease to compare with the people in the vaccine group (Offit 2020). Without an adequate placebo comparison group, we will not know if any of the vaccines under development actually work. But for both the person who already has COVID-19 and their attending ICU physician, there is undoubtedly a strong temptation to just try something now. Meanwhile, the scientists running clinical trials would argue that there will be many more patients in the future. More lives would be saved in the long run by doing the science as efficiently as possible. Of course, when it is you or your patient, it is hard to think about the big picture in strictly utilitarian fashion. It's even harder when it is your mother, father, or child.

### Thinking beyond Now

Delays are difficult for us. Somebody once said, "If the hangover came first, no one would drink." Immediate things fill our thoughts and tempt us. In contrast, the future is largely out of sight and mind. But in the face of a deadly global pandemic, we should be able to focus on the much larger long-term goals that may actually bring us back to normalcy in less time. Several other countries have been more resolute in their efforts and aggressive in finding and rooting out the virus, and in return for their sacrifices they now enjoy much more freedom of movement than we do.

New Zealand managed to go over 100 days without any community spread, during which they could gather in large groups without masks and engage in normal activities. In response to an August outbreak in Auckland, Prime Minister Jacinda Ardern returned the city to lockdown and postponed the general election (Roy 2020), but New Zealand now knows how to beat back the virus. The Kiwis have benefited from the geography of an island nation, but several other countries are doing well and returning to work and school ("Countries Beating COVID-19" 2020).

If the United States wants to control the virus and bring back economic activity before a vaccine is widely available, it will take a commitment to choosing the larger rewards of the future over the smaller ones we can have now. ■

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**STATEMENT OF OWNERSHIP, MANAGEMENT, AND CIRCULATION (Required by 39 U.S.C. 3685)**

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**[ SKEPTICAL INQUIREE** BENJAMIN RADFORD

Benjamin Radford is a research fellow at the Committee for Skeptical Inquiry and author or coauthor of a dozen books, including *Investigating Ghosts: The Scientific Search for Spirits*.

# Legend of the Mowing Devil

**Q:** **I understand that an early crop circle seems to be depicted in a famous seventeenth-century woodcut. What can you tell me about that?**

**—C. Blennerhassett**

**A:** Crop circles first appeared in the English countryside about fifty years ago. The designs—simple circles at first that grew in size and complexity over time—were mostly formed in wheat or barley, less commonly in oats or rapeseed. The distinctive patterns of flattened stalks rarely appear in other crops such as corn, cotton, vegetables, rice, and legumes; wheat and barley happen to be the types of plants that "lay down" the best when trampled, making them a natural choice for hoaxers.

Many people believe that crop circles have been reported for centuries, a claim repeated in countless books and websites devoted to the mystery. Their primary evidence is a woodcut from 1678 that appears to show a field of oat stalks laid out in a circle by a mysterious figure (see Figure 1).

The image is cited as evidence of early crop circles by some of the most respected and prominent crop circle researchers. Lucy Pringle, in her book *Crop Circles: The Greatest Mystery of Modern Times*, writes that "One very common misperception is that crop circles are a recent phenomenon. … The earliest representation of a crop circle occurs in a woodcut of 1687, which depicts the famous 'Mowing Devil'" (Pringle 1999, xii). In *Crop Circles: Signs of Contact*, Colin Andrews mentions it as "reference to an event that many of us today might describe as an account of the formation of a crop circle" (Andrews 2003). In a more empirical realm, physicist Richard Taylor, in an August 2011 article for *Physics World*, wrote that "the woodcut print … indicates that the stalks within the circle were flattened rather than broken—a practice that continues today" (Taylor 2011, 27).

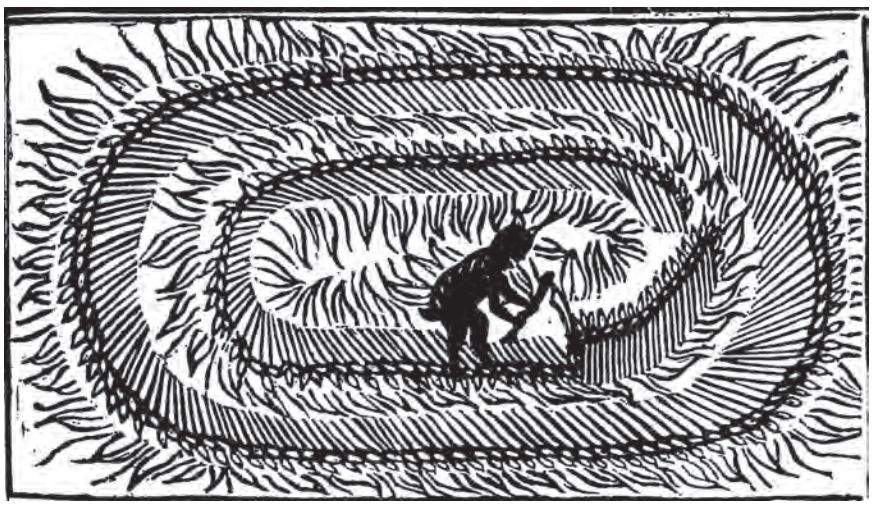

Figure 1. A 1678 woodcut claimed to be an early image of a crop circle

**Many people believe that crop circles have been reported for centuries, a claim repeated in countless books and websites devoted to the mystery.**

Paranormal proponents struggle with the incontrovertible dearth of hard

evidence for their claims and often are at pains to explain why there's so little historical record of apparently modern mysteries. This often occurs in the context of cryptozoology, for example, when indigenous myths and legends of spirits and figures are retroactively claimed to represent early sightings of particular mysterious creatures. In the pages of this magazine, I've written about examples, including the lake monster in British Columbia (see "Ogopogo the Chameleon," January/February 2006) and the Puerto Rican vampire el chupacabra (see "Mistaken Memories of Vampires: Pseudohistories of the Chupacabra," January/February 2016).

Researchers must be careful about accepting native stories and legends as true accounts of actual creatures. Just because a given culture has a name for, tells stories about, or depicts a strange or mysterious beast—be it Sasquatch or Ogopogo, dragon or leprechaun—doesn't necessarily mean that those references were meant to reflect reality. In *Lake Monster Mysteries*, which I coauthored with Joe Nickell, I refer to this as the Bangles Fallacy, after the 1980s rock group that hit the charts with "Walk Like an Egyptian." The song playfully assumes that Egyptians walked as depicted in ancient artwork.[1]

Artwork was of course one of the first mediums in which legends and stories were told throughout history, especially in preliterate ages. A sensational or intriguing image would anchor storytellers and their audiences, as well as help standardize the stories. This is especially true of religious morality tales intended to convey important lessons to the faithful about proper conduct. The innumerable artistic images of biblical miracles, for example, may be beautifully rendered but are not accurate depictions of historical events and aren't claimed to be (outside of strict Bible literalist circles).

As Michael Goss notes in the journal *Folklore*, "The contents of 'The Mowing Devil' seem to prove the rule that there is no new anomaly under the sun and that, given time, some industrious researcher is bound to turn up a historical precedent" for a recent phenomenon (Goss 1992, 190). Indeed, researchers John Michell and Bob Rickard note that when the woodcut was "rediscovered in 1989, the story was claimed as an early record of the crop circle phenomenon" (Michell and Rickard 2000, 188).

Thus the "crop circle" image must be interpreted with caution, through folkloric and historical perspectives. Though the woodcut is often presented out of its original context, we can locate the story it illustrates in an August 22, 1678, pamphlet (see Figure 2). The woodcut actually illustrates what in folklore is called a "mowing devil" legend, in which an English farmer told a worker with whom he was feuding that he "would rather pay the Devil himself" to cut his oat field than pay the fee demanded.

**The "crop circle" image must be interpreted with caution, through folkloric and historical perspectives.**

The story, titled "The Mowing-Devil: Or Strange NEWS out of Hertfordshire," begins with a tantalizing teaser summary that would not have been out of place on the cover of *National Enquirer* some three centuries later:

Being a True Relation of a Farmer

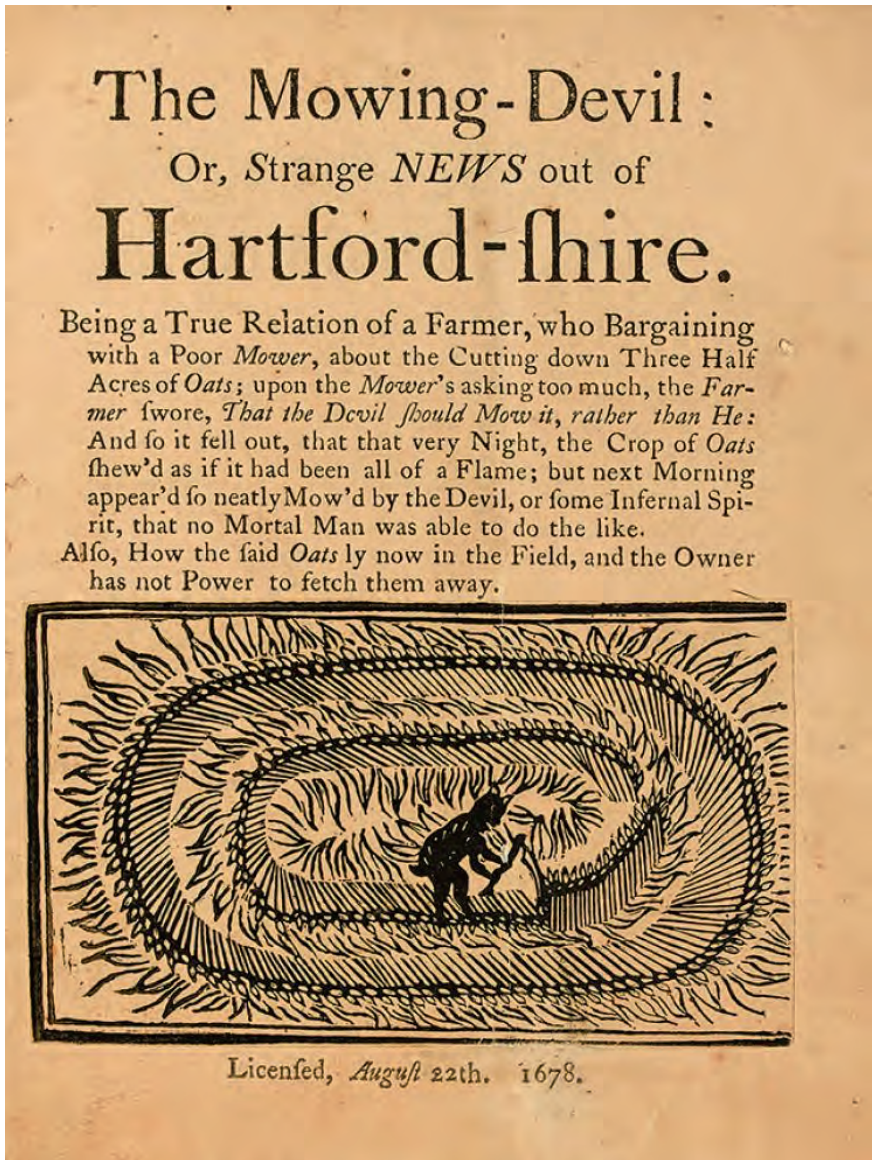
The Mowing-Devil:
Or, Strange *NEWS* out of
Hartford-ſhire.
Being a True Relation of a Farmer, who Bargaining with a Poor *Mower*, about the Cutting down Three Half Acres of *Oats*; upon the *Mower*'s asking too much, the *Farmer* ſwore, *That the Devil ſhould Mow it, rather than He:* And ſo it fell out, that that very Night, the Crop of *Oats* ſhew'd as if it had been all of a Flame; but next Morning appear'd ſo neatly Mow'd by the Devil, or ſome Infernal Spirit, that no Mortal Man was able to do the like.
Alſo, How the ſaid *Oats* ly now in the Field, and the Owner has not Power to fetch them away.
Licenſed, *Auguſt* 22th. 1678.

Figure 2. The 1678 pamphlet titled *The Mowing-Devil*, where the mowing devil image first appeared

> who, bargaining with a Poor Mower about the cutting down Three Half Acres of oats; upon the Mower's asking too much, the Farmer swore that the Devil should mow it rather than he. And so it fell out that very Night the Crop of Oats showed as if it had been all of a Flame, but next Morning appeared so neatly mow'd by the Devil, or some Infernal Spirit, that no Mortal Man was able to do the like … But not to keep the curious Reader any longer in suspense, the inquisitive Farmer no sooner arrived at the place where his Oats grew but to his admiration he found the Crop was cut down already to his hands; and as if the Devil had a mind to show his dexterity in the art of Husbandry and scorn to mow them after the general manner, he cut them in round circles and placed every straw with that exactness that it would have taken above an Age for any Man to perform what he did that one night; and the man that owns them is yet afraid to remove them. (Quoted in Newman 1945)

Thus, a close reading reveals that the connection to crop circles is tenuous at best. Not only do we have the original account stating twice, explicitly, that the crop was *cut* rather than laid down, but indeed the woodcut itself clearly shows a dark horned figure with a *scythe*—which cannot "lay down" stalks but can only cut them. Unlike in crop circles, the source of the harvesting is neither unknown nor mysterious—it is Satan himself, complete with signature horns and a tail.

To his credit, Colin Andrews eventually grudgingly acknowledges that the famous "crop circle" woodcut almost certainly has nothing to do with crop circles and that legends such as these "can be dismissed as pure fiction, although one could see the medieval mind interpreting natural phenomena as paranormal occurrences" (Andrews 2003, 39). Countless crop circle and paranormal enthusiasts, however, still refer to this as proof of centuries-old formations.

**A close reading reveals that the connection to crop circles is tenuous at best.**

In fact, the first real crop circles didn't appear until the 1970s, when simple circles began appearing in the English countryside, made by two men (Doug Bower and Dave Chorley) who created them as a hoax to make people think UFOs had landed. They were inspired by a widely reported 1966 incident in Tully, Australia, in which flattened grass was assumed to be related to a UFO sighting. The pair inspired countless copycats, with the number and complexity of the circles increasing dramatically, reaching a peak in the 1980s and 1990s. There are many theories about crop circle origins, but the only proven cause—and also the most parsimonious explanation—is artistic, mischievous humans. There's no need to give the Devil more than his due. ■

## Note

1. This error occurs in many other fields as well, such as pseudohistorians mistaking depictions in ancient Mesoamerican and Egyptian engravings and art for spaceships and so on. For more, see Kenneth Feder's *Encyclopedia of Dubious Archaeology*, as well as Philip Senter's article "Dragon Hoaxes: Piltdown Men of Creationism," SI, May/June 2019; Scott Burnett's article "A Stegosaur Carving on the Ruins of Ta Prohm? Think Again," July/August 2019; and Massimo Polidoro's columns "The Lure of Mysterious Paintings," May/June and July/August 2014.

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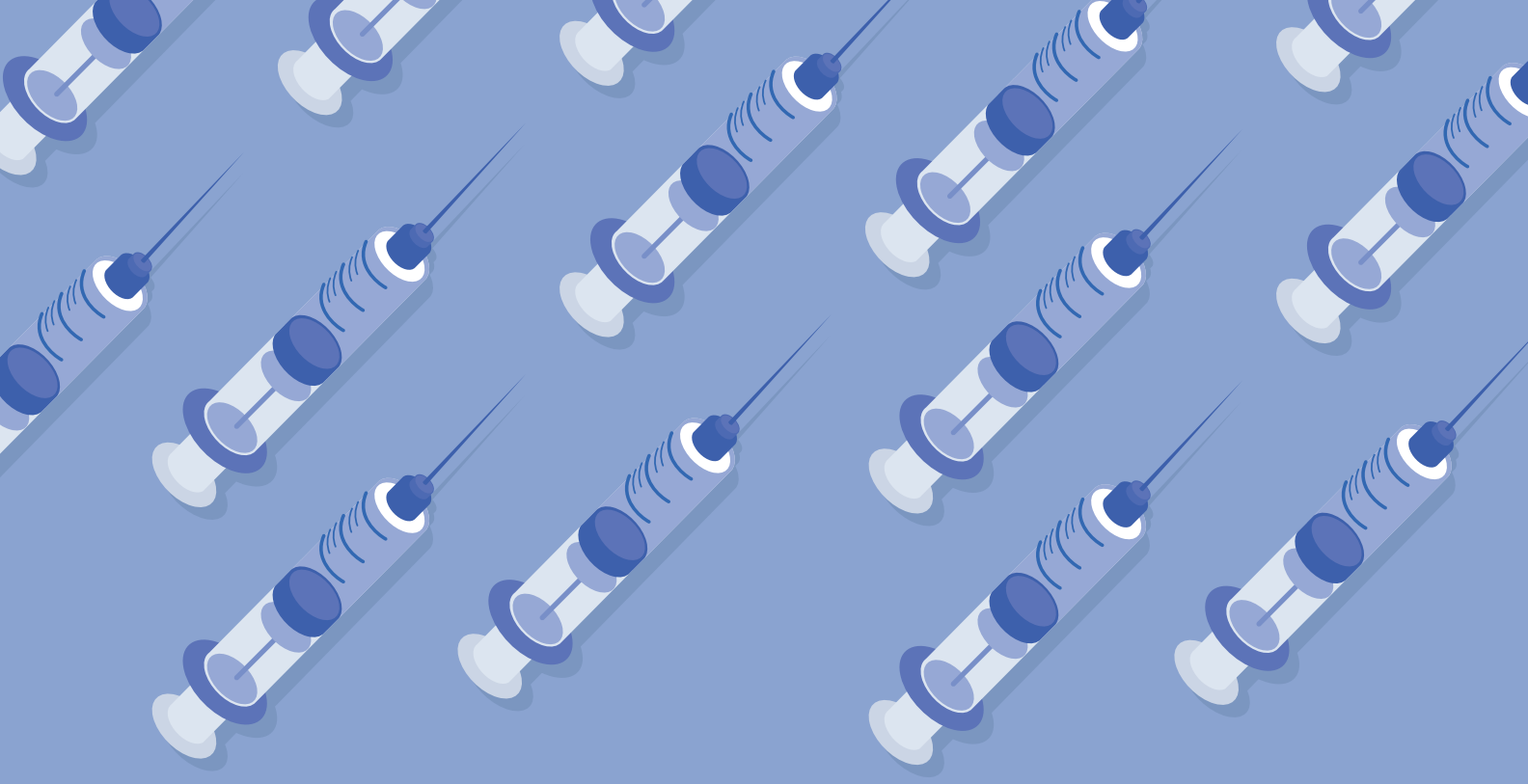

# THE SCIENTIFIC FRAUDS UNDERLYING THE FALSE MMR VACCINE-AUTISM LINK

Andrew Wakefield's 1998 paper purporting that the measles-mumps-rubella vaccine causes children to subsequently develop autism contained five specific frauds, and his subsequent comments on it contained another.

PETER N. STEINMETZ

With the production and distribution of the film *Vaxxed* and its successor *Vaxxed 2*, plus the notorious anti-vaccination/conspiracy video *Plandemic*, it has again become fashionable in some anti-vaccination circles to maintain that vaccines are medically ill-advised, provide little benefit given their risks, and are possibly pushed by a big government–Big Pharma cabal for the primary purpose of optimizing profits.

Of course, there are valid grounds for concerns regarding civil liberties given proposed government-mandated vaccination programs in taxpayer-funded schools. But to bolster the cabal theory, many want to claim that the original report by Dr. Andrew Wakefield of an association between autism and MMR vaccination was correct. They believe the subsequent outright retraction of that paper and its labeling as a fraud (*Lancet* editors 2010) was the work of this cabal to discredit a badly victimized Wakefield.

While Wakefield's theory is almost completely discredited within the biomedical research community, the adherents of the cabal theory simply regard that as proof of the strength of the influence of Big Pharma funding on biomedical research. To help set the record straight, let's review the facts surrounding the frauds in Wakefield's 1998 paper. We will look as close to the primary sources as reasonably possible. That way, anyone can review these sources to make their own determinations regarding these frauds.

On February 28, 1998, Wakefield was the lead author on a paper in the British medical journal *Lancet* titled "Ileal-Lymphoid-Nodular Hyperplasia, Non-Specific Colitis, and Pervasive Developmental Disorder in Children" (Wakefield et al. 1998), which reported an association in twelve children between treatment with the combined measles, mumps, rubella (MMR) vaccine and subsequent development of colitis and autism.

For our purposes, scientific fraud (Norwegian National Research Ethics Committees N.d.), or scientific misconduct, will be defined per the U.S. Office of Research Integrity (N.d.) as "fabrication, falsification, or plagiarism

in proposing, performing, or reviewing research, or in reporting research results." The ORI further defines "(a) Fabrication is making up data or results and recording or reporting them. (b) Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record."

### Six Fabrications and Falsifications

The primary fabrications and falsifications in the paper occur in five main areas. There is a sixth form of falsification in Wakefield's response (Wakefield 1998) to criticisms of the paper, which will be discussed later. The first three areas of falsification and fabrication concern the reporting of the scientific findings in the article.

#### *Fraud 1. Findings of Non-Specific Colitis*

The paper reported in its Table 1 that eleven of the twelve children examined had "non-specific colitis." This was apparently a phrase used by Wakefield in final revisions to summarize the results of the histopathological examination of the biopsies collected during ileocolonoscopy.

These slides were originally examined by the clinical pathologists at the Royal Free Hospital in London and were determined to be essentially normal (Deer 2010). Given this result, the research team decided to have the slides reexamined by medical school faculty. In this review, specific histological findings were scored on a 0–3 scale by Dr. A.P. Dhillon (Godlee 2011) along with a checkbox at the bottom for other findings, such as "non-specific" or "normal." In eleven of the twelve children, the "non-specific" box was checked for at least one biopsy site.

Evidently the checking of these boxes was then reported as "chronic non-specific colitis" by Wakefield in making final revisions to the paper (Deer 2010). The checkbox on the form filled out by Dhillon, however, may have simply meant that the findings on the slide were of uncertain significance.

When reviewed by two independent specialists in 2011, Geboes (2011) reported that "I see no convincing evidence of 'enterocolitis,' 'colitis,' [or a] 'unique disease process.'" Bjarnason (2011) reported that he and his colleagues "came to an overwhelming and uniform opinion that these reports do not show colitis."

The direction of each of the eleven errors is consistent in tending to overstate the association, and this is unlikely to be due to chance. The errors also included technical medical terminology implying a particular condition is present when it was not in most cases, though Wakefield was a gastroenterologist who knew the meaning of these terms.

It thus appears that Wakefield falsified the results presented in Table 1 of the paper by stating these were examples of non-specific colitis when in fact the totality of the data available at that time indicated something non-specific or of uncertain significance was present.

#### *Fraud 2. Timing of MMR Vaccine Administration and First Behavioral Symptoms*

The paper's Table 2 lists the "Interval from exposure to first behavioral symptoms." In one case this is listed as "immediately," two cases within twenty-four hours, one case within forty-eight hours, two cases within two weeks, one case within one month, and one case within two months. These reported temporal associations were used in the paper to bolster the case that there was an association between vaccine administration and subsequent development of behavioral problems, such as autism.

Brian Deer reviewed the hospital admission notes (Deer 2011) and the Medical Research Council (MRC) hearing transcripts (MRC Transcripts N.d.) and reported that of the eight of twelve cases that were reported as having first behavioral symptoms within one week, only two could be confirmed in the records. In some cases, such as Child 11, where Table 2 of the paper stated behavioral symptoms developed one week after vaccine administration, the hospital discharge note stated that behavioral symptoms began one month *before* administration of the MMR vaccine.

**It is unlikely that this was simply accidental copying errors. It indicates that the authors falsified the temporal associations between MMR vaccine administration and development of behavioral symptoms.**

The direction of all eight of these errors is consistent in tending to indicate a temporal association. It is unlikely that these were simply accidental copying errors. It indicates that the authors falsified the temporal associations between MMR vaccine administration and development of behavioral symptoms.

#### *Fraud 3. Findings of Regressive Autism*

Table 2 in the paper also lists for all twelve children their "Behavioral Diagnosis." This table lists nine of the twelve children as having autism and one additional child as possibly having autism.

Per reports reviewed by Deer (2011), including the MRC hearing transcripts (MRC Transcripts N.d.), only one child clearly had a diagnosis of regressive autism. Six of the nine listed as having regressive autism did not have this diagnosis, and five of the nine so listed had uncertain behavioral diagnoses.

The lack of underlying documentation of most of the children listed in Table 2 of the Wakefield paper as having regressive autism, when this is one of the main points of the paper, arguably rises to the level of fabrication of these results, insofar as documentation is just missing. Certainly it points to

Table 2 Neuropsychiatric diagnosis

| Child | Behavioural diagnosis | Exposure identified by parents or doctor | Interval from exposure to first behavioural symptom | Features associated with exposure | Age at onset of first symptom | |
|---|---|---|---|---|---|---|
| | | | | | Behaviour | Bowel |
| 1 | Autism | MMR | 1 week | Fever/delirium | 12 months | Not known |
| 2 | Autism | MMR | 2 weeks | Self injury | 13 months | 20 months |
| 3 | Autism | MMR | 48 h | Rash and fever | 14 months | Not known |
| 4 | Autism? Disintegrative disorder? | MMR | Measles vaccine at 15 months followed by slowing in development. Dramatic deterioration in behaviour immediately after MMR at 4·5 years | Repetitive behaviour, self injury, loss of self-help | 4·5 years | 18 months |
| 5 | Autism | None—MMR at 16 months | Self-injurious behaviour started at 18 months | | 4 years | |

MMR=measles, mumps, and rubella vaccine.

RETRACTED

The data presented in Table 2 of the 1998 Wakefield paper (above) lack documentation, which points to possible falsification.

falsification of the data presented in Table 2.

Two additional areas of fraudulent representations within the 1998 Wakefield et al. paper are not in the scientific findings but have to do with other scientific publication issues.

### *Fraud 4. Ethics Consent Statement*

The paper stated that "Ethical approval and consent investigations were approved by the Ethical Practices Committee of the Royal Free Hospital NHS Trust, and parents gave informed consent." A statement of this type is required for all medical and scientific publications to help prevent abuse of subjects in human subject research studies.

After questions were first raised by Deer (Horton 2004) and others regarding the nature of the investigations and whether they had been approved by the appropriate ethical practices committee, Murch (2004), one of the coauthors, stated that "The protocol for the 1998 *Lancet* paper was submitted on September 16, 1996" and "This protocol formed the basis for all children investigated in the 1998 *Lancet* paper, and all were investigated." Hodgson (2004) stated, "The investigation of these children was properly submitted to and fully discussed by the Ethical Practices Committee at the Royal Free Hampstead in 1996."

This issue was the focus of much investigation in the MRC hearings (MRC Transcripts N.d.), because many of the subjects in the paper were admitted to the hospital for studies prior to December 18, 1996, the date on which that research protocol was approved. On the basis of this and other ethical and practice violations, the General Medical Council struck (or revoked) the medical licenses of both Dr. Andrew Wakefield and Dr. John Walker-Smith. While both initially appealed these findings to the Administrative Court (England and Wales) High Court of Justice Administrative Court, Wakefield dropped out of the appeal. The primary argument in Walker-Smith's defense on appeal was that no such ethics committee approval was required because the investigations were for the clinical benefit of the children and were covered by a prior study approval for his work (Mitting 2012, #91, #93). This defense directly contradicts the statements of both Murch and Hodgson in 2004. Nonetheless, based on other evidence, Mr. Justice Mitting determined on appeal that it was not proven to the requisite criminal standard of proof that Walker-Smith had carried out the investigations without ethics board approval (Mitting 2012 #186, pp. 60–61). Re-

**Wakefield evidently inserted this standard language of an ethics consent approval statement. This was a falsification of the actual record to facilitate publication of the paper.**

garding the ethics approval statement in the paper, however, Mr. Justice Mitting found, "This statement was untrue and should not have been included in the paper" (Mitting 2012, #153, p. 47).

In finalizing the paper, there was a discussion of the wording of the ethics consent statement among the authors (Mitting 2012, #153, p. 46). Following this, Wakefield evidently inserted this standard language of an ethics consent approval statement. This was a falsification of the actual record to facilitate publication of the paper.

### *Fraud 5. Conflict of Interest Statement*

In 1998, at the time of the paper's submission, *Lancet*, like most medical journals, required that the authors sign a statement disclosing any actual conflicts of interest and any items that could be perceived as conflicts of interest. Wakefield declared no conflicts of interest with respect to the publication.

Unbeknownst to the editors or readers at the time, however, Andrew Wakefield had filed a patent for virological testing in 1995 (Wakefield 1995). He had been engaged as an expert by lawyer Richard Barr since February 1996 to work on a potential lawsuit against virus manufacturers (*Sayer et al. vs. Smithkline et al.* 2007). He was paid in total £435,643 (about $568,700 at current exchange rates) for this work (Deer 2007). Both the editor of *Lancet* (Horton) and a vice dean of the Royal Free and University College School of Medicine (Hodgson) stated in writing that this conflict should have been disclosed. Failing to disclose such an obvious potential monetary conflict of interest in the outcome was a form of falsification of the record to facilitate publication and improve the perceived impact of the findings.

There was a last form of fraud committed by Andrew Wakefield in connection with this paper, but it was not in the paper itself.

### *Fraud 6. Methods of Patient Referral*

Immediately after the paper was published, criticisms were raised regarding a possible strong bias in patient selection (Rouse 1998). Nearly all the patients were originally contacted through an anti-vaccine campaign and the solicitors attempting to sue the vaccine manufacturers (Deer 2011).

In the paper itself, this was described as, "We investigated a consecutive series of children with chronic enterocolitis and regressive developmental disorder" and "12 children, consecutively referred to the department of paediatric gastroenterology … ." In a subsequent response to this critique, Wakefield (1998) stated, "These children have all been seen expressly on the basis that they were referred through the normal channels (e.g., from general practitioner, child psychiatrist, or community paediatrician) on the merits of their symptoms."

When this was examined in detail during the MRC hearings (MRC Transcripts N.d., #35, p. 47), the committee found that Wakefield's statement in the response was dishonest and irresponsible. The case of referral of Child 12 was examined in detail as the mother testified and revealed that the mother was supplied with a "fact sheet" written by Wakefield prior to being seen. The levels of biasing in the findings for that child as revealed in the MRC transcripts are discussed in detail on the *Ibrb* blog (Cary 2012).

This issue was also addressed with respect to Wakefield's coauthor, Dr. Walker-Smith, during the appeal of the MRC findings. In that appeal, Mr. Justice Mitting found that the finding of the MRC panel was not correct with respect to Walker-Smith's coauthorship of the paper (Mitting 2012, #158–159, pp. 62–63). It is important to note that this finding on appeal did not address the MRC finding with respect to the dishonesty of Wakefield's separate response to criticism of the paper.

The significance of the findings in the paper depended on the route of referral. The findings would be stronger if they were found in a consecutive series of children who came to

the clinic; they would be weaker if they were found in a set of children chosen to potentially have the significant findings. By claiming that the referrals were through normal channels, when in fact the cases were selected for the findings prior to referral and the parents were prompted with the desired findings, Wakefield falsified this aspect of the scientific record.

### Other Types of Fraud

Commentators often simply state that Andrew Wakefield committed fraud in the study that was published in 1998. Other than the scientific fraud discussed above, there are other common meanings of the term. *Fraud* often refers to either criminal fraud or civil fraud, a tort. Wakefield was never tried for either type with respect to the 1998 paper and study.

Criminal fraud has several elements that must be proved to support a conviction (which depend in detail on the jurisdiction in question). These are 1) misrepresentation of a material fact; 2) by someone who knows that the material fact is false; 3) with intent to defraud; 4) to a person or entity who justifiably relies on the misrepresentation; and 5) actual injury or damages result from that reliance on the false representation. In both the United States and the United Kingdom, each of these elements would have to be proven beyond a reasonable doubt (Criminal Fraud N.d.).

In the case of the 1998 paper, it is unclear who the parties would be who were injured or damaged by the scientific frauds in that paper. Assuming such parties existed, it seems it would be difficult to prove beyond a reasonable doubt the third element, that Wakefield engaged in the fraud with the intent to defraud the person injured.

Civil fraud as a tort generally has as requisite elements the intentional misrepresentation or concealment of an important fact upon which the victim is meant to rely, and in fact does rely, to the harm of the victim. People who invested money in Wakefield's business proposal or the attorneys who paid him a large amount of money as a consultant for their lawsuits might have some claim for a monetary injury. Because the standard of evidence in a civil case is simply the preponderance of the evidence, the review of the scientific frauds above suggests such a lawsuit may have succeeded; however, none was ever brought.

### Conclusion

The scientific frauds in Wakefield's 1998 paper are clear from the readily available records, and it is clear why this paper was eventually retracted when the full record became available. Whether these would rise to the level of a civil or criminal fraud is unknown, as these scientific issues were never adjudicated in a court of law. While there are good reasons to consider the safety and efficacy of vaccines and for patients to be fully informed before being vaccinated, the alleged link between the MMR vaccine and autism is not one of them. ■

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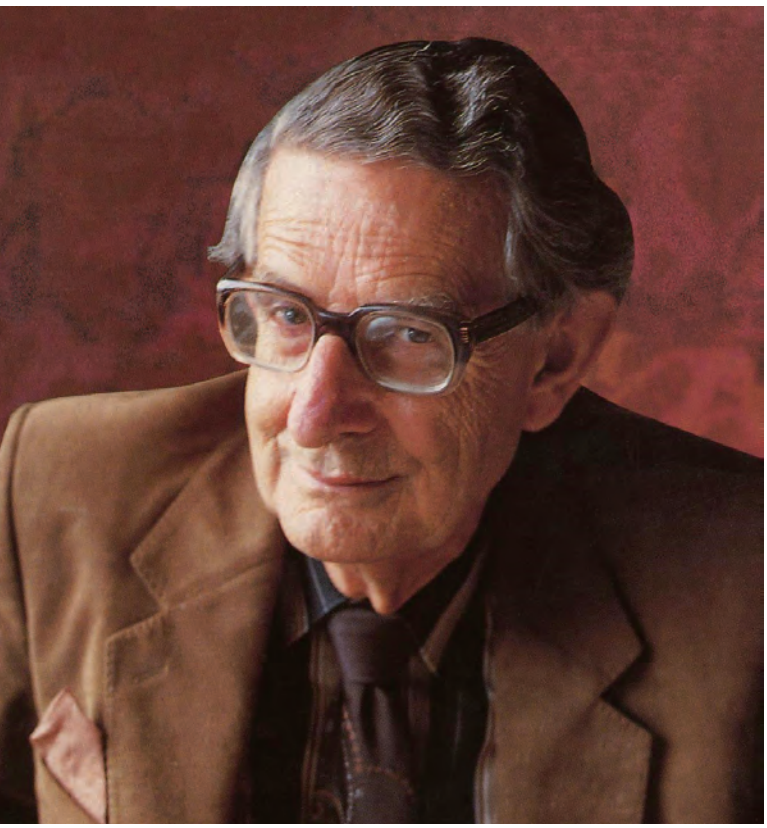
Peter N. Steinmetz is a research neurologist and chief scientist at the Neurtex Brain Research Institute. He received his MD and PhD from the Johns Hopkins University School of Medicine. He has a long-standing interest in skeptically examining claims of the magical and other fringe-science phenomena. He lives in Phoenix, Arizona.

# Hans J. Eysenck: The Downfall of a Charlatan

An orchestrated saga of intellectual dishonesty by the late renowned British psychologist and parapsychology proponent Hans J. Eysenck and two collaborators is revealed.

DAVID F. MARKS



Hans J. Eysenck

I write this article as a long-term investigator into psychology, health-related behavior, and claims of the paranormal. The article concerns an orchestrated saga of intellectual dishonesty by Professor Hans J. Eysenck, late of King's College London, and two of his acolytes: medical sociologist and therapist Ronald Grossarth-Maticek and the late Cambridge University psychologist Carl L. Sargent. This story will send shudders down the spines of many other Eysenck acolytes, but it is a story that must be told. The scientific record needs to be corrected and Eysenck's false claims excised.

### *Dramatis Personae*

At the time of his death in 1997, Eysenck was the third most cited psychologist in the world—only slightly behind Sigmund Freud and Jean Piaget. Eysenck's career was mired in controversy for his racist views on the genetics of intelligence, his acceptance of tobacco company funding to support his claim that personality is a more significant cause of cancer and heart disease than smoking, his advocacy of the tenuous scientific evidence on astrology, and his one-sided, credulous defense of parapsychology.

**This story will send shudders down the spines of many Eysenck acolytes, but it is a story that must be told.**

The three parties to this story practiced wishful thinking, bias, and willful deceit in equal measure. The main actor, Hans J. Eysenck, today stands accused of dozens of "unsafe" publications (more on that presently) and of fake science on an industrial scale. The second, Ronald Grossarth-Maticek, served as a kind of "sorceror's apprentice," providing Eysenck with copious quantities of impossible data; he remains in practice in Heidelberg, Germany. In return, Eysenck provided Grossarth-Maticek with an unvalidated certificate of qualification in behavior therapy (see https://www.ruprecht.de/2020/01/28/documents-from-the-property-of-ronald-grossarth-maticek/). The third, Carl L. Sargent, hero-worshipped Eysenck but, following credible accusations of fraud, had to leave his post at Cambridge University to seek another career in role-playing computer games. Meanwhile, Sargent had written four coffee-table books with Eysenck acclaiming the wonders of parapsychology and psychic powers.

Before we get to Eysenck's and Sargent's support of parapsychology, a much greater scandal has hit the headlines: allegations of data manipulation and fake scientific and medical claims in multiple dozens of "unsafe" publications. The journal that I edit, the *Journal of Health Psychology*, published Anthony Pelosi's (2019) exposé of a series of impossible findings that had been reported by Eysenck in the 1980s. My supporting editorial included an Open Letter to the Principal of King's College London, Professor Byrne, seeking a full investigation into H.J. Eysenck (Marks 2019). King's College responded by running an enquiry that reached the conclu-

sion that twenty-six of Eysenck's publications were "unsafe" (King's College London 2019). To date, there have been fourteen retractions and seventy-one "expressions of concern" on papers dating as far back as 1946 (for more on this, see the Retraction Watch database at retractiondatabase.org). News of the scandal broke in the *Guardian* (Boseley 2019) and in *Science* (O'Grady 2020). The story doesn't end here.

### Intellectual Dishonesty

Hans Eysenck's intellectual honesty was a subject of concern over many decades since suspicions surfaced in the 1960s. In those days, Eysenck's book *Uses and Abuses of Psychology* was required reading for all psychology undergraduates, and it sold millions of copies. Little did we imagine that the great man himself would later be proved to be one of psychology's principal abusers! One of my lecturers, Dr. Vernon Hamilton, revealed something about Eysenck's laboratory ways.

Hamilton privately told me that his ex-boss, Eysenck, *had cheated doing his data analyses*. Hamilton didn't stay long and was asked to leave the institution. This ultimately led to public conflict with Hamilton (Eysenck 1959). Similar unsettling concerns were raised by others working for or with Eysenck, and rumors circulated over several decades.

**Hans Eysenck's intellectual honesty was a subject of concern over many decades since suspicions surfaced in the 1960s.**

Anthony Pelosi (a psychiatrist at Priory Hospital Glasgow), with Louis Appleby, had critiqued Eysenck's research in the early 1990s, but no action to sanction Eysenck was taken. The only society of professional psychologists in Britain, the British Psychological Society, washed its hands of Eysenck. The Society had got its fingers burned investigating the earlier massive data fraud by Sir Cyril Burt, and it was unwilling to risk another scandal by investigating Eysenck—who purely coincidentally(?) was Burt's most famous student. Additionally, the 2019 King's College investigation was half-baked. The unnamed investigating committee ignored Eysenck's multiple single-authored publications even though they were based on the very same datasets supplied by Grossarth-Maticek, craftily diverting the blame away from Eysenck toward his ever-willing apprentice (Marks and Buchanan 2020).

Richard Smith, retired editor of the *British Medical Journal*, astutely remarked:

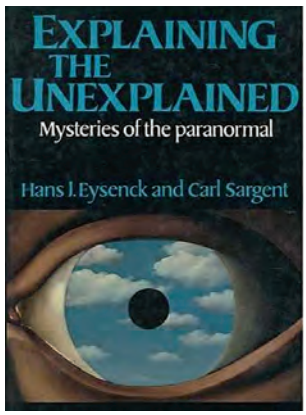
> When forensic accountants detect fraud they assume that everything else from that person may well be fraudulent. Scientists tend to do the opposite—assuming that everything is OK until proved to be fraudulent. But as proving fraud is hard, lots of highly questionable material remains untouched. … I think of the example of R. K. Chandra, who was eventually found guilty not only of research fraud but also of financial and business fraud. His first paper established to be fraudulent was in 1989. Why, I ask myself, would you start being honest after you'd practiced fraud—yet hundreds of his papers are left unremarked, including unfortunately some that have been shown to be fraudulent. (Smith 2020)

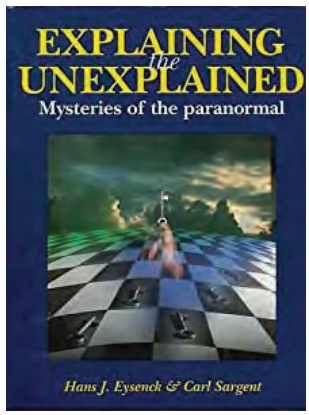
A reliable source and long-time colleague of Eysenck states: "Eysenck was a mendacious charlatan. I base that not so much on his published fiction but his denial of the link between smoking and cancer was pernicious. His espousal of the beliefs of the John Birch Society was egregious … a grant had to be withdrawn and several researchers dismissed." Not good.

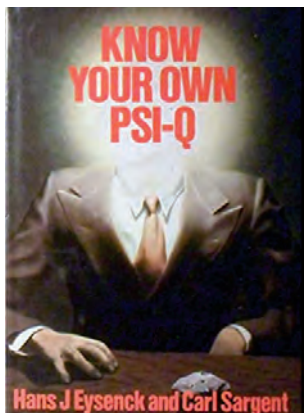
### Hans Eysenck's Books on Parapsychology

A profile of Hans Eysenck based on his biography by Rod Buchanan and also on his parapsychology books with Carl Sargent provides insights into Eysenck's intellectual values as a scientist and scholar. There were four books with Sargent, all having Eysenck as first author: *Explaining the Unexplained: Mysteries of the Paranormal* (1982), *Know Your Own Psi-Q* (1983), *Explaining the Unexplained: Mysteries of the Paranormal* (2nd Ed.) (1993), and *Are You Psychic?* (1996). The collaboration between the two authors began in the early 1980s in Sargent's heyday at Cambridge and continued until 1996.

These four books present a distorted and strongly biased view that psychic powers are scientifically proven, when in fact



evidence suggests exactly the opposite (Marks 2020).

Eysenck's and Sargent's naiveté and credulity are everywhere apparent. In one of their books, Sargent and Eysenck argued that the experiments of William Crookes with the medium Daniel Dunglas Home were evidence of supernatural powers. Yet critics such as Victor Stenger noted that "Crookes gullibly swallowed ploys such as this and allowed Home to call the shots … his desire to believe blinded him to the chicanery of his psychic subjects" (Stenger 1990, 156–157).

Eysenck and Sargent present a totally one-sided view of the scientific evidence on psi. They affect the naive and frankly idiotic stance that fraud and trickery do not need to be considered. David Nias and Geoffrey Dean (1986) summarized their criticisms of the Eysenck/Sargent books thus: "the failure of Eysenck and Sargent's books to cover trickery and credulity is a serious deficiency" (368).

These books are among the most distorted and misleading accounts of parapsychological phenomena ever published by academic psychologists. The four books are a total disgrace, and how Eysenck had the gall to put his name to them—perhaps only to build his reputation as the fearless contrarian—is beyond imagination. In addition to the terrible scholarship, there is convincing evidence of scientific fraud by Sargent. How much Hans Eysenck knew about this, we will never know because Eysenck's wife destroyed his papers after his death. However, Susan Blackmore's report on Sargent's fraud became public knowledge several years into the collaboration and years before the third and fourth books with Eysenck were published.

**Eysenck and Sargent present a totally one-sided view of the scientific evidence on psi. They affect the naive and frankly idiotic stance that fraud and trickery do not need to be considered.**

Carl Sargent; Source: *Dungeon Master Magazine*

If Sargent had kept his trickery hidden from Eysenck, then Eysenck could have been an innocent party. In a partnership built over more than fourteen years, surely there would have been a conversation that included a question of the kind, "Oh, I hear you left Cambridge, why was that?" If, as seems likely, Sargent admitted the occurrence of some kind of experimental "error," then Eysenck would have been party to covering up Sargent's deceit. Did Eysenck imagine nobody would notice? Or perhaps he simply did not care. After all, that great Cambridge genius, Isaac Newton, had done the same kind of thing, and Eysenck saw no problem with a bit of data fudging. According to Eysenck, a genius does whatever is necessary to prove his or her theories, as he stated in one of his many potboilers.

**According to Eysenck, a genius does whatever is necessary to prove his or her theories, as he stated in one of his many potboilers.**

### Chronology of Events

A chronology of events shows how the career of this aspiring parapsychologist unfolded:

1979: The University of Cambridge awards Sargent a PhD, which he claims was the first awarded to a parapsychologist by this university.

1979: The Society for Psychical Research provides a grant to Susan Blackmore enabling her to visit Sargent's lab at Cambridge in November. The original plan was to visit for a month. However, Blackmore was only able to stay eight days from November 22–30, 1979. Blackmore summarized her visit to Sargent's lab this way:

> [Sargent's Ganzfeld] research was providing dramatically positive results for ESP in the GF and mine was not, so the idea was for me to learn from his methods in the hope of achieving similarly good results. … After watching several trials and studying the procedures carefully, I concluded that CS's [Carl Sargent's] experimental protocols were so well designed that the spectacular results I saw must either be evidence for ESP or for fraud. I then took various simple precautions and observed further trials during which it became clear that CS had deliberately violated his own protocols and in one trial had almost certainly cheated. I waited several years for him to respond to my claims and eventually they were published along with his denial. (Harley and Matthews 1987; Sargent 1987; see also Marks 2020)

1980: Sargent writes a monograph, *Exploring Psi in the Ganzfeld*. Parapsychological Monographs No 17.

1980: Sargent, Harley, Lane, and Radcliffe publish "Ganzfeld Psi Optimization in Relation to Session Duration" in *Research in Parapsychology*.

1981: Sargent and Matthews publish "Ganzfeld GESP Performance in Variable Duration Testing" in *Journal of Parapsychology*.

1982: Eysenck and Sargent publish their first book together, *Explaining the Unexplained: Mysteries of the Paranormal*.

1983: Eysenck and Sargent publish their second book, *Know Your Own PSI-Q*.

### The Inevitable Downfall

1984: The Parapsychological Association Council asked Martin Johnson to head a committee to investigate Blackmore's accusation of fraud by Sargent. My book *Psychology and the Paranormal* describes what happened next: "The Parapsychological Association (PA) invited CS to provide an account of the 'errors' that SB [Susan Blackmore] had reported, but he declined to offer any explanation. The PA President, Stanley Krippner, wrote to CS at four different addresses, but still received no reply. The PA's 'Sargent Case Report' dated 10 December 1986 found that, in spite of strong reservations about CS's randomisation technique, there was insufficient evidence that CS had used unethical procedures."

Sargent was "reproved" for failing to respond to the Parapsychological Association's request for information. However, Sargent had allowed his membership to lapse through non-payment of dues and was informed that, should he wish to renew his membership, his application would be considered with "extreme prejudice," i.e., Sargent would be unlikely to be readmitted as a member.

**Sargent was "reproved" for failing to respond to the Parapsychological Association's request for information.**

The final report of this committee reprimanded Sargent for failing to respond to their request for information within a reasonable time.

1985: Sargent leaves Cambridge University and the parapsychology field (stated in the 2nd edition of *Explaining the Unexplained: Mysteries of the Paranormal*, 1993). Sargent moves into full-time authoring of game-books.

1987: Susan Blackmore's 1979 "A Report of a Visit to Carl Sargent's Laboratory" is finally published in *Journal of the Society for Psychical Research*.

1993: Undeterred by the report of cheating, Eysenck and Sargent publish their third book, *Explaining the Unexplained: Mysteries of the Paranormal*. (2nd ed.)

1996: Eysenck and Sargent publish their fourth book, *Are You Psychic?: Tests & Games to Measure Your Powers*, a revised version of *Know Your Own Psi-Q*.

**Undeterred by the report of cheating, Eysenck and Sargent published their third book in 1993.**

### The Hidden Truth

Two editions of the book by H.J. Eysenck and Sargent (1982, 1993) raise questions about how much Eysenck knew of the fraud accusations against Sargent in Blackmore's Society for Psychical Research report of 1979. In the 1982 edition of the first book, the procedural problems with Sargent's Ganzfeld research are not even mentioned. In the 1993 edition, the authors refer to "spirited exchanges on GF research" between Blackmore, Sargent and Harley (189).

Dr. Ronald Grossarth-Maticek

However, the Ganzfeld evidence of psi is described by them as "very, very powerful indeed." They do not mention the accusations of fraud against Sargent, his departure from Cambridge University, or his repeated noncooperation with the Parapsychology Association enquiry. I obtained an update from Susan Blackmore on her current thinking about her thirty-year-old allegation of fraud by Sargent and on psi research more generally, which I reproduce below. Here are Susan Blackmore's answers to a few specific questions:

> DM: Do you think, in the light of everything that has come to light, CS committed fraud at Cambridge? (Ideally, a yes or a no).
>
> SB: Yes, at least on one specific trial.
>
> DM: Do you think CS knowingly deceived anybody (including possibly himself) or was he simply a victim of confirmation bias/subjective validation?
>
> SB: The former.
>
> DM: Is there anything else you would like to say about

research on psi?

SB: In the light of my decades of research on psi, and especially because of my experiences with the GF, I now believe that the possibility of psi existing is vanishingly small, though not zero. I am glad other people continue to study the subject because it would be so important to science if psi did exist. But for myself, I think doing any further psi research would be a complete waste of time. I would not expect to find any phenomena to study, let alone any that could lead us to an explanatory theory. I may yet be proved wrong of course. (Blackmore 2019)

## Conclusions

With this history, we can establish the following facts and conclusions.

1. A pattern of data manipulation in Hans J. Eysenck's and two of his collaborators' research is evident over several decades. The earliest paper of concern was published in the *Proceedings of the Royal Society of Medicine* in 1946. Following a recent exposure in the *Journal of Health Psychology* by Pelosi (2019) and an ensuing enquiry by King's College London (2019), journals have retracted fourteen of Eysenck's papers and published seventy-one expressions of concern.

2. A reliable source accused Eysenck of cheating with his data analyses as early as the 1960s. Eysenck's colleagues and PhD students at that time publicly critiqued Eysenck's laboratory methods, but no action was taken.

3. In the late 1970s and early 1980s, Eysenck formed a long-term collaboration with Cambridge parapsychologist Carl Sargent. Although Carl Sargent had been accused of fraud in 1979, Eysenck publications with Sargent occurred over the period 1982–1993. These books grossly distorted the scientific evidence of the paranormal.

4. Anthony Pelosi and Louis Appleby (1992; 1993) and others raised serious questions about publications by Eysenck with R. Grossarth-Maticek. The authorities failed to respond.

5. Anthony Pelosi (2019) again voiced his concerns. My own editorial (Marks 2019) appealing to Kings College London to open an enquiry finally led to concrete action. Twenty-five publications by H.J. Eysenck and R. Grossarth-Maticek were deemed by Kings College London to be unsafe, yet the true number of unsafe publications is most likely well over 100.

6. As suspicions strengthened over a seventy-five-year period from the mid-1940s, torpor and complacency in the academic system enabled research malpractice to continue, not only Eysenck's, Grossarth-Maticek's, and Sargent's, but across the board.

7. The currently available systems for regulating research integrity and malpractice in the United Kingdom are an abject failure. A totally new approach is required. An Independent National Research Integrity Ombudsperson needs to be established to significantly improve the governance of academic research. Perhaps then, future Hans Eysencks can be stopped in their tracks. ■

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### Related Articles in Skeptical Inquirer

*These previous articles in SI deal, in part, with Eysenck collaborator Carl Sargent's questionable papers:*

Susan Blackmore, "Another Scandal for Psychology: Daryl Bem's Data Massage," November/December 2019

Susan Blackmore, "Daryl Bem and Psi in the Ganzfeld," January/February 2018

Susan Blackmore, "Psi in Psychology," Summer 1994

Susan Blackmore, "The Elusive Open Mind: Ten Years of Negative Research in Parapsychology," Spring 1987

David F. Marks is a psychologist, author, and founder/editor of the *Journal of Health Psychology.* Among his books are *The Psychology of the Psychic* (1980, with R. Kammann, and 2000, 2nd ed.) and most recently *Psychology and the Paranormal: Exploring Anomalous Experience*, published by Sage in July 2020. He is a longtime fellow of the Committee for Skeptical Inquiry. His blogsite is at davidfmarks.com.

# Why We Need Science

We are so easily fooled that there are many ways we can get things wrong—such as believing an ineffective medical treatment works. Luckily, there is a way to get things right: by scientific testing.

HARRIET HALL

Most patients—and even many medical doctors and scientists—have not grasped how important it is to use rigorous science to evaluate claims for medical treatments. All too often people decide to try a treatment that is irrational, hasn't been tested, or has been tested and shown not to work. Why do they make those bad decisions?

How can you know whether a medical treatment works? If others say it worked for them, your Aunt Sally swears it cured her, there's someone in a white lab coat lecturing about it on YouTube, and you try it and your symptoms go away, you can pretty much assume it really works. Right? No, wrong! That's all the "evidence" most people need, but it's not evidence at all.

No, you can't make that assumption, because sometimes we get it wrong. For many centuries, doctors used leeches and lancets to remove blood from their patients. Everyone *knew* bloodletting worked. When you had a fever and the doctor bled you, you got better. Everyone knew of friends or relatives who had been at death's door until bloodletting cured them. Doctors could recount thousands of successful cases. George Washington accepted the common wisdom that bloodletting was effective. When he got a bad throat infection, he let his doctors remove so much of his blood that his weakened body couldn't recover, and he died. When scientists finally tested bloodletting, they found out it did much more harm than good. Patients who got well had been getting well *in spite of* bloodletting, not *because* of it. And some patients, including Washington, died unnecessarily.

People can be absolutely certain they are right when they are actually wrong. People can be fooled, including me and you. As Richard Feynman said: "The first principle is that you must not fool yourself—and you are the easiest person to fool."

Personal experience can be very impressive, but it is unreliable. Testimonials are anecdotes that can suggest which treatments might be worth testing, but they are not reliable evidence of efficacy.

### 'It Worked for Me'

People say, "It worked for me!" Well, maybe it didn't. They have no basis for claiming that it "worked." All they can really claim is that they observed an improvement following the treatment. That could indicate a real effect, an inaccurate observation, or a *post hoc ergo propter hoc* error—a false assumption that correlation in time meant causation. Such observations are only a starting point: we need to do science to find out what the observations mean. A commenter on the *Science-Based Medicine* blog wrote this testimonial: "I have witnessed first hand the life that begins to flow through the body upon the removal of a subluxation."

What does this even mean? Does he expect anyone to believe this just because he says it? Would he believe me if I

said I had witnessed firsthand the invisible dragon in Carl Sagan's garage? Another commenter wrote that advocates of science-based medicine "seem to think that even if they see something with their own eyes that they can't believe it if there are no double blinded officially published studies to prove that what they saw actually happened."

Well, yes, that's pretty much what we do think, and we are appalled that you don't understand it yet, because it's the whole reason we have to do science. I would phrase it a bit differently: "Seeing something with my own eyes doesn't prove it's true, and it doesn't preclude the necessity for scientific testing."

### Perception and Interpretation

We can't believe our own eyes. The process of vision itself is an interpretive construct by the brain. There are blind spots in our field of vision that we aren't even aware of because our brain fills in the blanks. I saw a magician cut a woman in half on stage—that was an illusion, a false perception. I saw a patient get better after a treatment—but my interpretation that the treatment caused the improvement may have been a mistake, a false attribution.

### Sometimes We Get It Wrong

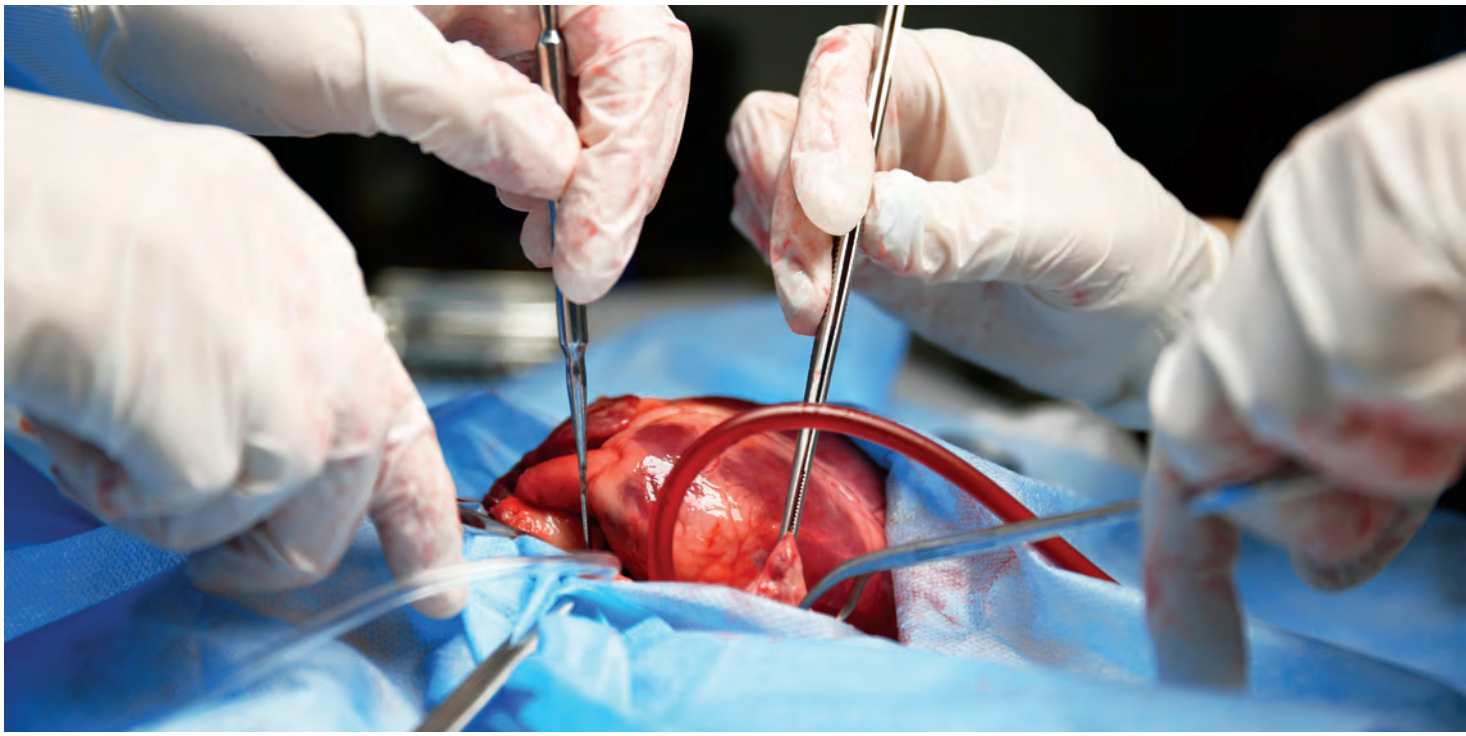
Before we had science to test treatments, sometimes we got it wrong. We were probably more often wrong than right, and even modern doctors sometimes get it wrong. Not long ago, doctors used to do an operation for heart disease where they opened the chest and tied off chest wall arteries to divert more blood flow to the heart. They had an impressive 90 percent success rate. Dr. Leonard Cobb wanted to make sure, so he did a sham surgery experiment where he just made the incision in the chest and closed it back up without doing anything else. He discovered that just as many patients improved after the fake surgery! Doctors stopped doing that operation.

**I saw a patient get better after a treatment—but my interpretation that the treatment caused the improvement may have been a mistake, a false attribution.**

How could so many people be so wrong? How could they believe something had helped them when it actually had done them more harm than good? There are many reasons people can come to believe an ineffective treatment works.

*The disease may have run its natural course.* A lot of diseases are self-limiting; the body's natural healing processes restore people to health after a time. A cold usually goes away in a week or so. To find out if a cold remedy works, you have to keep records of successes and failures for a large enough number of patients to find out if they really get well faster with the remedy than without it.

*Many diseases are cyclical.* The symptoms of any disease fluctuate over time. We all know people with arthritis have bad days and good days. The pain gets worse for a while, then it gets better for a while. If you use a remedy when the pain is bad, it was probably about to start getting better anyway, so the remedy gets credit it doesn't deserve.



*We are all suggestible.* If we're told something is going to hurt, it's more likely to hurt. If we're told something is going to make it better, it probably will. We all know this; that's why we kiss our children's scrapes and bruises. Anything that distracts us from thinking about our symptoms is likely to help. In scientific studies that compare a real treatment to a placebo sugar pill, an average of 35 percent of people say they feel better after taking the sugar pill. The real treatment has to do better than that if we're going to believe it's really effective (not to mention spend money on it).

*There may have been two treatments and the wrong one got the credit.* If your doctor gave you a pill and you also took a home remedy, you may give the credit to the home remedy. Or maybe something else changed in your life at the same time that helped treat the illness and was the real reason you got better.

*The original diagnosis or prognosis may have been incorrect.* A lot of people have supposedly been cured of cancer who never actually had cancer. Doctors who tell a patient he has only six months to live are only guessing and may be wrong. The best they can do is say the median survival for similar patients is six months—but that means half of the patients live longer than that.

*Temporary mood improvement can be confused with cure.* If a provider makes you feel optimistic and hopeful, you may think you feel better when the disease is really unchanged.

*Psychological needs can affect our behavior and perceptions.* When people want to believe badly enough, they can convince themselves they have been helped. People have been known to deny the facts—to refuse to see that the tumor is still getting bigger. If they have invested time and money, they don't want to admit it was wasted. We see what we want to see; we remember things the way we wish they had happened. When a doctor is sincerely trying to help a patient, the patient may feel a sort of social obligation to please the doctor by reporting improvement.

*We confuse correlation with causation.* Just because an effect follows an action, that doesn't necessarily mean the action caused the effect. When the rooster crows and then the sun comes up, we realize it's not the crowing that made the sun come up. But when we take a pill and then we feel better, we assume it was the pill that made us feel better. We don't stop to think that we might have felt better for some other reason. We jump to conclusions like in the story of a man who trained a flea to dance when it heard music, then he cut the flea's legs off one by one until it could no longer dance and concluded that the flea's organ of hearing must be in its legs!

So, there are a lot of ways we can get it wrong. Luckily, there's a way we can eventually get it right: by scientific testing. There's nothing mysterious or complicated about science: it's just a toolkit of commonsense ways to test beliefs against reality. If you believe you've lost weight and you step on the scale to test your belief, that's science. If you think you have a better way to grow carrots and you test your idea by planting two rows side by side, one with the old method and one with the new method, and see which row produces better carrots, that's science. To test medicines, we can sort a large number of patients into two equal groups and give one group the treatment we're testing and give the other group an inert placebo, such as a sugar pill. If the group that got the active treatment does significantly better, the treatment probably really works.

Jacqueline Jones was a fifty-year-old woman who had suffered from asthma since the age of two. She read about a miraculous herbal treatment that cured a host of ailments, including asthma. She assumed the information was true, because it included a lot of testimonials from people who had used it and were able to stop taking their asthma medications. They *knew* it worked; they had *seen* it work. Sick of the side-effects of conventional drugs, Jones stopped using her three inhalers, steroids, and nebulizer and took the herbal supplement instead. Within two days she had a massive asthma attack with complications that kept her hospitalized for six weeks.

**There are a lot of ways we can get it wrong. Luckily, there's a way we can eventually get it right: by scientific testing.**

All those people who said that herbal remedy had cured their asthma got it wrong. Asthma symptoms fluctuate. Maybe their symptoms would have improved anyway. Whatever the reason, the remedy had not been tested scientifically and was not effective for treating asthma. Believing those testimonials almost cost Jacqueline her life.

The next time a friend enthusiastically recommends a new treatment, stop and remember that they could be wrong. Remember Jacqueline Jones. Remember George Washington. Sometimes we get it wrong. ■

*An earlier version of this article appeared on the* Science-Based Medicine *blog.*

Harriet Hall, MD, is a contributing editor and regular columnist for the Skeptical Inquirer as well as a weekly contributor to and one of the editors of the *Science-Based-Medicine* blog.

# Sources of Quantum Voodooism

Quantum physics has been trivialized, distorted, abused, and exploited by New Age spiritual leaders for decades. What is their infatuation with it? What singles it out?

SADRI HASSANI

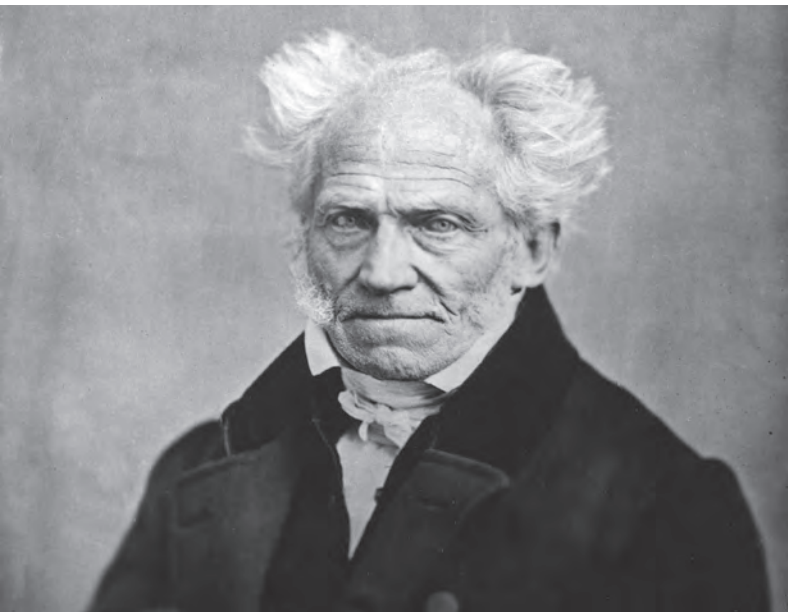
In a series of episodes aired on her show in 2007, Oprah Winfrey talked about the then-new sensational New Age phenomenon known as *The Secret*, a movie by Australian film producer Rhonda Byrne, who later wrote a book of the same title that, due to Winfrey's enthusiastic endorsement, became an international bestseller. *The Secret* maintains that by merely *thinking* about losing weight, making more money, and falling in love, you can become thin, wealthy, and happily married. In one episode, Rhonda Byrne is joined by four "teachers"—well known self-help gurus who had chosen to disseminate the idea, much like the disciples of a prophet—in a speciously scientific discussion of the law of attraction, magnetic power, energy, frequency of mind vibration, and the vibration of the universe. All these buzzwords are the overture to the selling point of the conversation in which the author of *Chicken Soup for the Soul* proclaims, "If you go to quantum physics, we realize everything is energy" (see video at https://www.youtube.com/watch?v=9qwZMVe2WVY).

Marianne Williamson, former Democratic presidential candidate, designates "quantum realm of possibilities" as the source of "the good, the true, and the beautiful" and a solution to slavery, disenfranchisement of women, and segregation (Williamson 2019). She resorts to quantum physics to assert that "as our perception of an object changes, the object itself literally changes" (Williamson 1996) and that to change the world all we have to do is change our mind about the world. With this premise, would-be president Williamson's solution to all world problems is only a meditation away, and she has quantum physics to back her up! This is not a far-fetched, farcically concocted claim. When Hurricane Dorian was dashing toward Florida, Williamson advised her followers to stop it with their minds (Levin 2019).

The Indian guru Maharishi Mahesh Yogi instructs Deepak Chopra to "explain, clearly and scientifically, how [certain meditation techniques] work." The result is a sophomoric concoction, which Chopra calls *Quantum Healing*, to explain its connection with Ayurveda (Hassani 2016). The publication of *Quantum Healing* was a milestone in the rampant trivialization of quantum physics by self-help gurus. Searching for the oxymoron "quantum spirituality" on Amazon.com yields several hundred titles. All have the word *quantum* in their titles or subtitles or on various pages inside. In these titles, one finds statements such as, "Quantum Angel Healing uses techniques rooted in the science of quantum physics, which proves that the thoughts and belief system of the observer influences the outcome of a situation" (Mora 2011); "[Quantum] physics suggested that the consciousness of the observer brought the observed object into being" (McTaggart 2002); and if that's too murky, "Quantum mechanics reveals that … your perception determines the shape of your reality" (Peirce 2009).

Marianne Wiliamson

How did quantum physics become such a ludicrous gewgaw among modern gurus? The influence of *Quantum Healing* cannot be underestimated, but Chopra was a medical doctor with no background in physics. Why did he choose quantum physics to advance his absurd "scientific" theory of Ayurveda? One clue may be found in the 1960s, when the unpopularity of the Vietnam War opened the floodgates of the Western peace movement to the mystical beliefs of the Far East, where the atrocities of war were on display. To dissociate physics from the "military-industrial complex," books such as *The Tao of Physics* and *The Dancing Wu Li Masters* drew



Arthur Schopenhauer

on quantum physics to paint physics as the embodiment of the "peaceful" Eastern mysticism. But why quantum physics? It turns out that the quantum physics–mysticism association goes back to the founders of quantum physics themselves, and the convergence of three factors facilitated that association: the infiltration of Eastern thought in Western philosophy, the rise of mysticism in the West, and the unique character of quantum physics.

### Eastern Theosophy in Western Philosophy

As he was putting the finishing touches on his PhD thesis in 1813, Arthur Schopenhauer was introduced to a Latin translation of the *Upanishads*, ancient Sanskrit texts that contain some of the central philosophical concepts of Hinduism. To Schopenhauer, the *Upanishads* were the most elevating reading in the world, and he prophetically predicted that their philosophy would become the cherished faith of the West. He was so intrigued by the texts that he read passages of the book before going to sleep every night.

Schopenhauer's intellectual path to Eastern theosophy begins with his critique of Kant's *thing-in-itself*, a mind-independent entity that is beyond all human experience yet serves as the primary cause of our sensory perception. Schopenhauer maintains that our sensations cannot have an external cause, and that if we are to refer to the *thing-in-itself*, then we must come to an awareness of it, not by invoking the relationship of causality but by accepting that the world has a double-aspect, namely a "will" (a mindless, aimless, nonrational impulse at the foundational being of everything) and a "representation" (what we perceive around us). Will and representation are one and the same reality, regarded from different perspectives, like two sides of a coin, neither of which causes the other. The Hindu dualism of Brahman and Atman, with Brahman being "unlimited, unborn, not to be reasoned about, not to be conceived" (Müller 1884) and Atman being the true self, has a striking resemblance to Schopenhauer's will and representation. This should come as no surprise, because by the time his major work, *The World as Will and Representation*, came out in 1818, Schopenhauer had been perusing the *Upanishads* for five years.

According to Schopenhauer's philosophy, the great chain of being—the rocks, trees, animals, and human beings—is a complicated multitiered objectification of the meaningless will. The will's final tier of objectification appears when our minds introduce the forms of time, space, and causality, not to mention logic, mathematics, geometry, and moral reasoning. When the will is objectified at this level, the world of everyday life emerges. Thus, the laws of nature, along with the objects that we experience, *are our own creation* (Wicks [2003] 2017).

Deepak Chopra

### Rise of Mysticism in the West

One of the unintended consequences of the physics that began with Galileo and Newton was the eventual decline in the traditional western religions. Laplace's response, "Sire, I had no need of that hypothesis," to Napoleon's remark that there was no mention of God in Laplace's *Celestial Mechanics*, and Nietzsche's declaration—through Zarathustra's mouth—that "God is dead," created a moral vacuum by the end of the nineteenth century that could be filled only by a belief system that worshipped no supreme being. The filler turned out to be a salmagundi of spiritualism, esoteric Western philosophies, and Eastern thought.

Spiritualism was a movement rooted in the belief that the spirits of the dead existed and continued to evolve. Mediums were individuals gifted with the ability to communicate—in sessions known as séances—with the spirits and learn about the knowledge they had gained about God in the afterlife. Spiritualism gained enormous popularity among European intellectuals of that period. A prominent supporter of spiritu-

Arthur Eddington

alism was Sir Arthur Conan Doyle, the creator of the famous detective Sherlock Holmes. To assess the degree to which séances mesmerized the intellectuals of this period, suffice it to say that on one occasion, Harry Houdini, the American magician who became a leading opponent of the spiritualist movement, performed an impressive trick in the presence of Doyle. Houdini assured Doyle that the trick was pure illusion and that he was attempting to persuade Doyle not to endorse phenomena simply because he had no explanation for them. Doyle, nevertheless, refused to believe it was a trick and insisted that Houdini himself possessed supernatural powers ("Arthur Conan Doyle" 2019)!

The mediums' trickery was so impressive that even some well-known scientists ended up advocating spiritualism. In 1905, the well-known medium Eusapia Palladino came to Paris, where Nobel-laureate physicists Pierre and Marie Curie and some of their fellow scientists periodically investigated her. In 1906, five days before his accidental death, Pierre Curie wrote about his last séance with Palladino: "There is here, in my opinion, a whole domain of entirely new facts and physical states in space of which we have no conception" (Quinn 1995).

Another movement filling the moral void was theosophy, a potpourri of Western philosophies and Asian thought such as Hinduism and Buddhism. Because science had undermined the essence of traditional Western religions, theosophy proclaimed itself as an advocate of science. By 1902, Rudolf Steiner had transformed the teachings of the theosophy movement into anthroposophy, which he advertised was the science of an objective, intellectually comprehensible spiritual world accessible to human experience.

The flood of mysticism ravaging through Europe in the first decade of the last century eventually got a foothold in the mainstream science. In 1920, Arthur Eddington, the famous British astronomer, published a popular book in which he introduced the special and general theories of relativity to a nontechnical audience. But Eddington went beyond a mere exposition of the science. He arbitrarily subjected some of the mathematical symbols in the theory of relativity to his own philosophical interpretation and concluded, "All through the physical world runs that unknown content, which must surely be the stuff of our consciousness. … we have found that where science has progressed the farthest, the mind has but regained from nature that which the mind has put into nature" (Eddington 1920). Eddington's attribution of mysticism to relativity was too artificial to catch the attention of the public significantly, despite the public's appetite for the unification of science and the supernatural. For a "natural" unification, the public had to await the discovery of quantum physics.

**Eddington's attribution of mysticism to relativity was too artificial to catch the attention of the public significantly, despite the public's appetite for the unification of science and the supernatural.**

### Eastern Theosophy in Quantum Physics

Quantum physics is a highly mathematical theory that predicts probabilities of physical phenomena involving subatomic particles, and *probability defies explanation*. But the founders of quantum physics, unaccustomed to the new notion, could not swallow this fact. They looked for terrains of knowledge beyond mathematics and physics that could "make sense" of the strangeness of quantum physics, and philosophy was the only secular branch of knowledge that

Werner Heisenberg

Wolfgang Pauli

contained a huge repository of possible explanations.

As the probabilistic nature of quantum physics assented to the absence of causality, the founders' philosopher of choice became Arthur Schopenhauer, whose emphasis on the mindless, aimless, irrational will "made sense" of the randomness of quantum physics. Either through Schopenhauer or directly, the founders of quantum physics—Niels Bohr, Werner Heisenberg, Wolfgang Pauli, and Erwin Schrödinger—all developed a strong affinity for Eastern theosophy and, regrettably, *tied their science to that mystical viewpoint*. Here is Bohr talking about the parallel between Buddhism/Taoism and quantum physics:

> For a parallel to the lesson of atomic theory … we must in fact turn to quite other branches of science, such as psychology, or even to that kind of epistemological problems with which already thinkers like Buddha and Lao Tse have been confronted, when trying to harmonize our position as spectators and actors in the great drama of existence. (Bohr 2010)

Heisenberg was most influential in injecting Eastern thought in quantum physics. In his 1929 journey to the Far East, he had a long conversation with the Indian poet Rabindranath Tagore, subsequent to which he claimed to have realized that all fundamental aspects of physical reality, which had been so difficult for him and his fellow physicists to "make sense" of, "was the very basis of the Indian spiritual traditions. 'After these conversations with Tagore,' [Heisenberg] said, 'some of the ideas that had seemed so crazy suddenly made much more sense'" (Capra 1989).

Heisenberg recalls that during the famous 1927 Solvay Conference, some of the younger attendants gathered in the lounge of their hotel to converse about religion and science and the contrast between the religious beliefs of Planck and Einstein. While Planck firmly believed in a Christian personal god that was outside the realm of science, Einstein's god was the immutable laws of nature. To Pauli, who was present at the gathering, Einstein's perspective allowed the unity of object and subject (Einstein himself detested such unification and vehemently opposed any attribution of subjectivity to science). Pauli saw Planck's separation of object and subject as a threat to the ethics and values of society and found the solution in a spiritual framework where faith and knowledge, science and religion, object and subject are unified. He expressed hope in Bohr's complementarity because it implied that "the idea of material objects that are completely independent of the manner in which we observe them proved to be nothing but an abstract extrapolation. … In Asiatic philosophy and Eastern religions we find the complementary idea of a pure subject of knowledge, one that confronts no object" (Heisenberg 1971).

Pauli's belief in Eastern theosophy was tied to his great admiration of Schopenhauer, of whom he said, "Schopenhauer has exercised a lasting and fascinating effect on me, and he seemed to me to anticipate a future turn in the natural sciences" (Enz 2002). In fact, his veneration of Schopenhauer was so great that he defended the pseudoscientific notion of extrasensory perception because "Even so thorough critical a philosopher as Schopenhauer has regarded parapsychological effects as not only possible, but as supporting his philosophy" (Pauli 1994).

Schrödinger recalls how, after accepting a post as a lecturer in theoretical physics in Czernowitz, he had planned to spend all his free time acquiring a deeper knowledge of philosophy, having just discovered Schopenhauer, who introduced him to the *Unified Theory of Upanishads*. Schopenhauer's objectification by will is the essence of this Schrödinger statement: "Mind has erected the objective outside world of the natural philosopher out of its own stuff" (Schrödinger 2012). Schrödinger recognizes the paradox of individuals having different minds while there is only one world: "There is obviously only one alternative, namely the unification of minds or consciousnesses. Their multiplicity is only apparent, in truth, there is only one mind. This is the doctrine of the *Upanishads*" (Schrödinger 2012, 129).

Today's physicists, for the most part, are interested mainly in the theoretical and experimental ramifications of quantum physics, and in that pursuit we have been blessed with inventions such as transistors, lasers, and microchips, as well as the theoretical understanding of the tiniest constituents of matter and the largest galaxies. The majority of physicists brush aside the philosophical implications of quantum physics, because they have come to realize that if they try to understand quantum physics in terms of philosophy, they "will get down the drain" (Feynman 1967).

The founders' object-subject unification, which modern

gurus have renamed "the experimenter effects," has played a prominent role in the academization of pseudoscience. Larry Dossey is the executive editor of *Explore: The Journal of Science and Healing*, a journal that, despite the scientific reputation of its publisher Elsevier, is devoted to pseudoscience. Dossey offers a list of suggestions on the future research in his field, prayer healing. His third suggestion is: "In view of the evidence for experimenter effects, the preexisting beliefs of prayer experimenters should be ascertained and recorded as part of the study" (Dossey 2008). In other words, the results of studies that negate the efficacy of prayer in healing could be attributed to the disbelief of the experimenters!

### Messenger versus Message

Given a *printed* copy—to eliminate identification from handwriting—of a newly discovered piece of music, a musicologist specializing in Beethoven can not only identify it as the work of the master but also determine the period of the composer's creativity in which it belongs. That cannot happen in science! Einstein presented his general relativity field equation on November 25, 1915, to the Prussian Academy. Five days earlier, David Hilbert, the great German mathematician, had presented a talk containing the same equation to the Royal Academy of Sciences in Göttingen (Thorne 1995). A historian of physics, given the printed version of the two equations, could not tell which one is Einstein's and which one is Hilbert's. Such simultaneous creativity—so common in science that Nobel Prizes in a given field are often awarded to multiple scientists—is unheard of in other creative areas; the notion of two artists creating the same *Mona Lisa* is preposterous!

**Such simultaneous creativity is unheard of in other creative areas; the notion of two artists creating the same *Mona Lisa* is preposterous!**

Scientific geniuses share many of the same kinds of strength and weakness that we possess. Outside their areas of expertise, they are quite ordinary characters who can be poor judges of politics, religion, morality, and philosophical outlook. (See "The Nobel Disease," Skeptical Inquirer, May/June 2020.) Einstein encouraged President Roosevelt to initiate the development of atomic weapons; Linus Pauling, winner of two Nobel Prizes (chemistry and peace), was the originator of orthomolecular therapy, a dangerous alternative medical procedure; and James Watson, the codiscoverer of the double helical nature of DNA, is an ardent racist. But these mistakes are not made right because of the science of their makers, just as the science is not made wrong because of the mistakes of its discoverers. However, the beneficiaries of the self-help industry proclaim that just as Eroica cannot be separated from Beethoven, the founders' mystical object-subject unification cannot be separated from quantum physics. They contend that ancient scriptures of the Far East are based on quantum physics. Nothing is further from the truth! The mystical views of quantum physics' founders were published in proceedings and trade books with no scientific editing or reviewing, because the publishers who printed their physics would have refused to publish their baseless viewpoints, and the founders themselves were fully aware of that. An important fact is buried under modern gurus' intense—and unfortunately successful—campaign of marrying their nonsense with quantum physics: *The messenger is not the message*. ■

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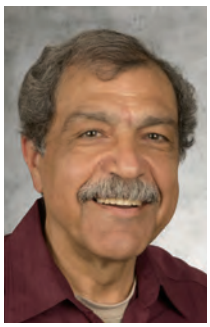
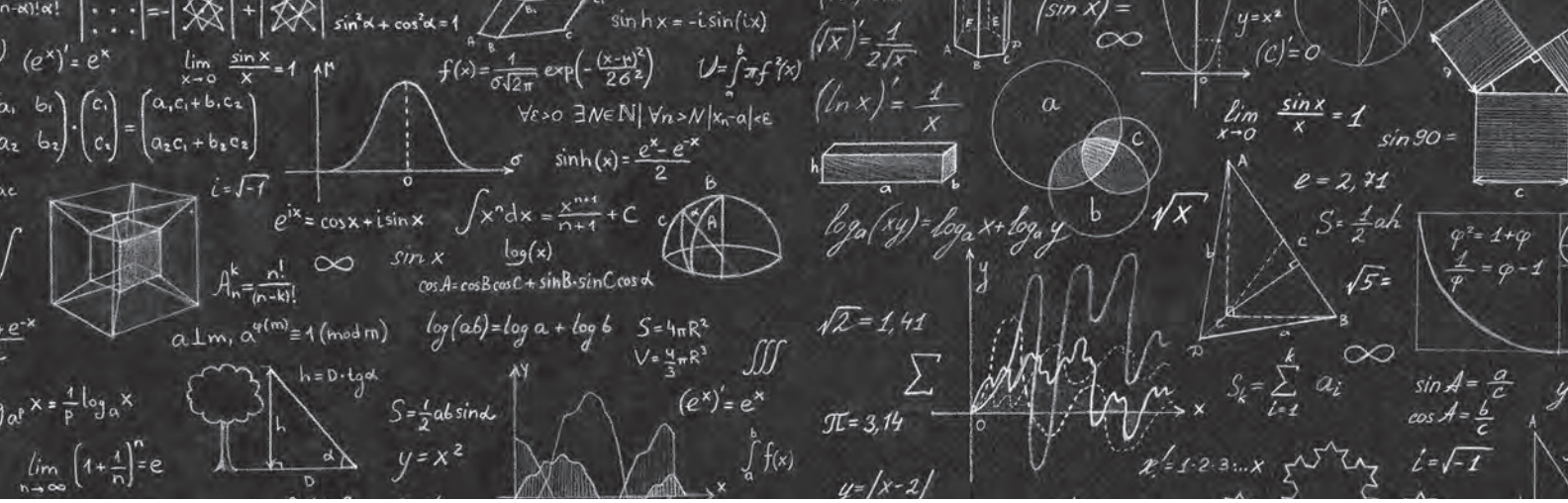



Sadri Hassani is professor emeritus of physics at Illinois State University and author of several books at graduate, undergraduate, and introductory levels. His blog at skepticaleducator.org is devoted to exposing misconceptions and distortions of science. His previous SI articles are "Why E-Cat is a Hoax" (January/February 2019), "Deepak Chopra's 'Physics'" (January/February 2016), and "'Post-Materialist' Science? A Smokescreen for Woo" (September/October 2015).



# 100 Authors against Einstein: A Look in the Rearview Mirror

Ninety years ago, 100 scientists published objections to Albert Einstein's theory of special relativity. Examining their misguided criticisms provides lessons for today.

MANFRED CUNTZ

A highlight of Albert Einstein's work was the theory of special relativity, which greatly modified the classical mechanics of Isaac Newton. Einstein's work is considered one of the pillars of modern physics, but some scientists rejected Einstein's work for decades. Their refusal to accept Einstein's work has been well documented, including in the book *Hundred Authors against Einstein*.

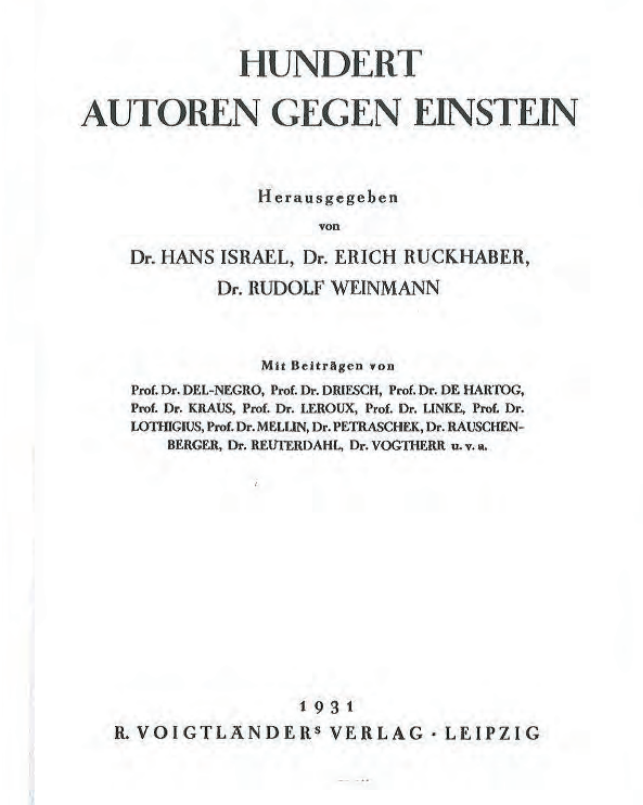
## Introduction

Albert Einstein is widely considered one of the greatest scientists of all time. The early breakthrough giving rise to his multi-decade plethora of outstanding contributions is his assembly of the special relativity theory. This profoundly important piece of work was later augmented through the introduction of the general relativity theory. Special relativity is relevant at speeds that are non-negligible compared to the speed of light; in that respect, the special relativity is a significant generalization of the previous work by Isaac Newton and others. Most notably, special relativity employs a fundamentally new concept, space-time. Consequences of this new concept include the revision of the addition theorem for velocities and the acceptance of the relativity of simultaneity.

Both special relativity and general relativity are integral parts of modern-day physics. Historically, a key motivation for the development of special relativity was the outcome of the Michelson-Morley experiment (Michelson and Morley 1887; see also, e.g., Eisele et al. 2009 for follow-up research). It was an attempt to detect the existence of the luminiferous ether. Yet the ether turned out to be nonexistent, and the speed of light was identified as identical in all directions, a heavy blow for classical physics and strong support for special relativity. However, time dilation and Lorentz contraction, both key features of special relativity, are too small to be measurable at regular speeds. A subsequent example providing confirmation of the time dilation as predicted by special relativity theory includes the Hafele-Keating experiment, which studied the behavior of cesium-beam clocks on commercial airliners flying around the world (Hafele and Keating 1972a; Hafele and Keating 1972b).

Another important aspect of the special relativity theory is the equivalence between mass and energy, epitomized by the famous equation $E = mc^2$. The underlying process of energy generation based on the conversion of mass readily operates inside of stars, including the sun (e.g., Wallerstein et al. 1997). In modern times, this process is also utilized by nuclear power plants to supply energy for millions of people around the globe. Recent examples for the success of the *general* relativity theory include the detection of gravitational waves (Abbott et al. 2016) and the detection of the Schwarzschild precession in the orbit of a star near the galactic center supermassive black hole (Abuter et al. 2020).

However, the acceptance of Einstein's work was fundamentally different ninety years ago. At the time, some leading members of academia emphatically opposed his special relativity theory. They published numerous articles and statements. In 1931, a booklet was published titled *Hundert Autoren gegen Einstein* (*Hundred Authors against Einstein*, Israel et al. 1931) featuring many of those ill-informed contributions.


HUNDERT
AUTOREN GEGEN EINSTEIN
Herausgegeben
von
Dr. HANS ISRAEL, Dr. ERICH RUCKHABER,
Dr. RUDOLF WEINMANN
Mit Beiträgen von
Prof. Dr. DEL-NEGRO, Prof. Dr. DRIESCH, Prof. Dr. DE HARTOG,
Prof. Dr. KRAUS, Prof. Dr. LEROUX, Prof. Dr. LINKE, Prof. Dr.
LOTHIGIUS, Prof. Dr. MELLIN, Dr. PETRASCHEK, Dr. RAUSCHEN-
BERGER, Dr. REUTERDAHL, Dr. VOGTHERR u. v. a.
1931
R. VOIGTLÄNDERS VERLAG · LEIPZIG

*Hundert Autoren gegen Einstein* (*Hundred Authors against Einstein*) booklet cover.

### Criticism Gone Wrong

In total, 121 authors are identified as opponents to the special relativity theory. *Hundred Authors against Einstein* contains contributions from twenty-eight authors that greatly vary in length and are the main focus of this article. A further ninety-three authors are listed as also having rejected the special relativity theory—with some also having publications. The geographical distribution of the authors' affiliations shows that eighteen contributions originated from Germany and two from Austria. There were eight contributions from other countries—Czechoslovakia, Finland, France, Italy, the Netherlands, Sweden, Switzerland, and the United States. Almost all contributions were written in German except two, which were written in English and French, respectively, and those have subsequently been translated. The contributions vastly differ in length, ranging from just one paragraph to several pages.

An assessment of the contributions given in *Hundred Authors against Einstein* shows that no one thoroughly applied the scientific method, as otherwise they would have found the mistakes in their arguments and consequently would have positively acknowledged Einstein's work. However, most of those authors used some mathematical or physical reasoning in the broad sense of those terms that ultimately felt short in seriously countering Einstein, mostly because of ignorance or denial. In six cases, the authors rejected special relativity mostly or entirely on philosophical or religious grounds or they got engaged in quibbling. For example, general objections based on ethics, philosophy, and religion have been voiced by De Hartog (Amsterdam). In those cases, there is no attempt of applying the scientific method at all.

To obtain further insight into the failures and shortcomings of recognizing special relativity, I focused on four key aspects: (1) the new concept of space-time; (2) the speed of light as a constant regardless of the motion of the source or observer (as well as the implied nonexistence of the ether); (3) the revised addition of velocities, replacing the customary formula of Newton's mechanics (thus ensuring that any resulting speed cannot surpass the speed of light); and (4) the relativity of simultaneity. The latter stipulates that whether or not two events occur at the same time is not absolute but depends on the observer's reference frame.

Results are given in Table 1. It shows that the largest objections against special relativity were to the concept of space-time, with the constancy of the speed of light and the relativity of simultaneity as follow-ups, with the number counts given as 22, 15, and 10, respectively. Moreover, a total of eleven and six articles rejected the special relativity theory because of two or three of those aspects, respectively, whereas one article was in denial of all four aspects. More than once, the significance of the Michelson-Morley experiment was disputed in addition to making the allegation that Einstein does not understand physics.

### Notable Examples

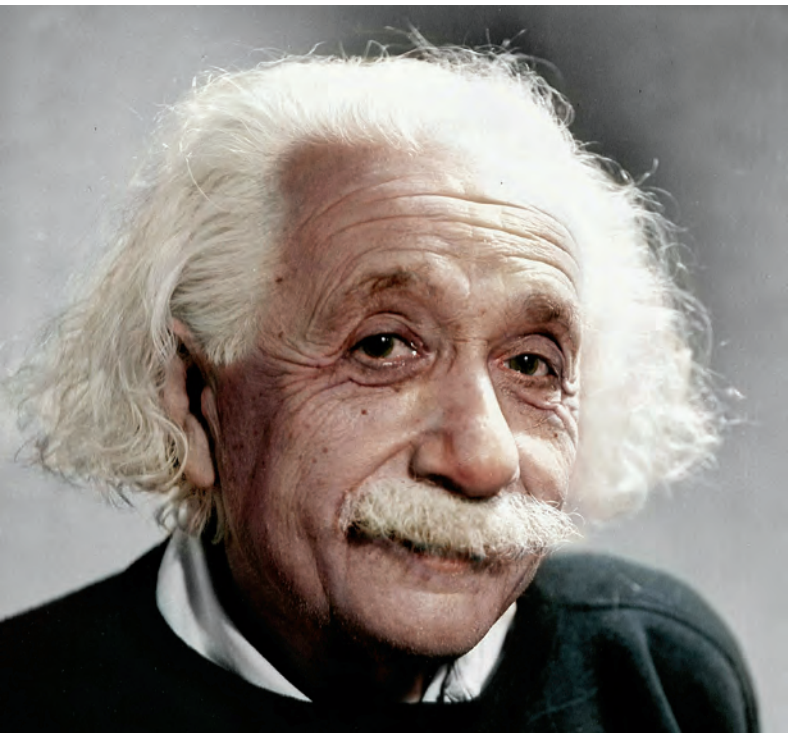
#### *The Most Trivial*

A trivial and superficial attack on Einstein's special relativity theory was made by G. Richter (Bozen, South Tyrol, Italy). For the most part, Richter shies away from listing the various features of the special relativity theory or aspects arising from considering the scientific method. Richter's criticism is mostly highly general; he repeatedly summons plausibility arguments. This approach is also reflected in the title of his

Table 1:

**Reasons Given for Rejection of Special Relativity Theory**

Space-Time: 22 articles
Light-Speed Constant: 15 articles
Addition of Velocities: 5 articles
Relativity of Simultaneity: 10 articles
Space-Time and Light-Speed Constant: 7 articles
Space-Time and Addition of Velocities: 1 article
Space-Time and Relativity of Simultaneity: 3 articles
Three items: 6 articles
Four items: 1 article



Albert Einstein

contribution, which (in translation) reads: "The Relativism of the Special-Temporal Scale Can Only Be Identified with the Help of an Absolute Scale." Richter repeatedly refers to Einstein's work as trivial or nonsense. Particularly, he does not mention Einstein's success (e.g., the correct description of the precession of Mercury's perihelion). Additionally, Richter does not discuss any experiments or observations that support the special relativity theory; surely, he also does not propose experiments himself. Richter's general credo is that Einstein must be wrong because his work is in stark contrast to what people already know to be valid.

### *The Most Comprehensive*

Arguably, the most comprehensive attack on the special relativity theory may have been the contribution by G. Wendel (Liebstadt, East Prussia, now renamed Milakowo and situated in Poland). Wendel lists a total of thirty-five counterpoints with respect to most of Einstein's work available at the time. Wendel's list is very extensive, and he argues that Einstein was confusing numerous terms in physics. Examples of Wendel's allegations include that Einstein is confusing *measured space* with *real space* and *space* with *mass*. Wendel states that Einstein's concept of curved space is an unbelievable mistake in thinking. He also criticizes that Einstein does not accept the ether in consideration of the fact that (according to Wendel and others, of course) the ether is definitely needed to assure the propagation of light. Additionally, following Wendel, "relative motion" is nonsense considering that any relative motion is based on an absolute frame. Thus, Wendel even seems to disagree with concepts of Newton's mechanics. Finally, he is concerned that the special relativity theory will result in the dissolution of the entire world because basic terms such as *space*, *time*, *force*, and *causality* are being canceled.

### *The Most Embarrassing*

Another effort to disprove Einstein's special relativity theory was by A. Reuterdahl (St. Paul, Minnesota, United States). He provides a list of eleven fundamental mistakes by Einstein and furthermore lists four deceits, including allegations of plagiarism. The list of the so-called mistakes follows the pattern also pointed out by other authors who have criticized Einstein's work. It includes the assertion that there is an absolute speed of light and complains that the new concept of space-time is in error. Reutendahl claims that he himself had used the latter term already in two previous talks; however, he did so in a much broader sense, encompassing other processes as well, including gravity(!) and electrical, thermal, and mechanical effects. Reutendahl also argues that the formulae about the aberration of light and the one describing the precession of the perihelion of Mercury had been published before. Of the latter, it is known that the lion's share of the precession is due to planet-planet gravitational interaction, but Einstein's work provided another term needed to explain the observation; Reutendahl may have been confused here.

### *The Most Cynical*

There are several contributions that are highly ignorant, but the text by W. Rauschenberger (Frankfurt), titled "Anti-Einstein," clearly deserves the label "most cynical." Most of the text deals with listing various aspects of the special relativity theory in an effort to make it appear highly illogical. Key points include the author's refusal to accept the modified formulism of adding velocities and the relativity of simultaneity. He uses the German term *Grundsinnlosigkeit* (i.e., complete absence of basic sense), but this term is very rarely used in German—it may even have been invented by Rauschenberger to get his points across. Finally, he laments that special relativity was steadily gaining popularity. He surmises that "logic and reason are apparently too simplistic and boring to satisfy people," which he identifies as one of the causes for the increased recognition of the special relativity theory. He continues to argue that "from time to time set-backs and catastrophes are supposed to happen (such as wars) in order to elevate the status of reason and to enlighten mankind." Note that this text was written a few years prior to the rise of Adolf Hitler and the start of World War II—perhaps a premonition of the evil ahead.

### *The Most Obnoxious*

There are various contributions that could be regarded as highly obnoxious. However, in my opinion this attribute best applies to the text by L. Goldschmidt (Jena), titled "Ignorance and Arbitrariness." It attacks both Einstein and Hermann Weyl, a famous mathematician and theoretical physicist contemporary of Einstein. Goldschmidt argues

that Einstein's work does not deserve to be called a "theory" due to its failures as well as Einstein's lack of philosophical understanding. He also says that Einstein's work is in part ancient. In conclusion, Goldschmidt recommends that for Einstein and Weyl to obtain insight into the ignorance and arbitrariness of their work, a long-term university-based education would be required.

### Attacking the Special Relativity Theory through Language

Efforts to overcome and replace special relativity theory must be based on advanced theoretical work, novel observations, or both. However, some previous authors whose contributions appear in *Hundred Authors against Einstein* did so through the virtue of language and advanced quibbling. Examples include the contributions by W. Kuntz (Spandau, now a suburb of Berlin) and Strehl (Hof, Bavaria). Kuntz argues that progress means to replace subjectivity and relativity of human conceptions by objective validity. He also asserts that liberation from relativity is the standard for new findings. Therefore, in Kuntz's opinion, Einstein failed. Moreover, Strehl states: "The theory of Einstein is in my opinion a functional transformation of reality. His system of reference: Variable space and time metric, constant speed of light (despite a nonconstant index of refraction) is not my taste." Thus, in Strehl's view, science is a matter of seasoning.

### Lessons for Today

Contributions from *Hundred Authors against Einstein* carry important lessons for today. The lines of attack against Einstein stem from arrogance, ignorance, denial, and prejudice. Regarding the latter, detailed analyses have been forwarded (e.g., Goenner 1993) and references therein have pointed out that one of the driving forces against Einstein's work was Einstein's Jewish heritage. These prejudices were further amplified by the right-wing political climate in Germany and other countries at the time.

Nevertheless, the contributions in *Hundred Authors against Einstein* appear in general to be shaped by scientific incompetence. In fact, many of the contributions in *Hundred Authors against Einstein* do not bother with scientific reasoning at all. Most of the texts notably shy away from seriously attempting to apply scientific methods; others are even further off and thus do not remotely meet established scientific standards. Some of the criticism is just plain funny, whereas some other criticism is pitiful at best. For others, the saying "Don't confuse me with facts, I already have made up my mind" would accurately describe the author's approach.[1] And for others, especially those who attempt to disprove the special relativity theory through twists of language, philosophy, or religion, the quote by Wolfgang E. Pauli applies: "That is not only not right; it is not even wrong" (as translated from Pauli's native German).[2] The essence of this quote is, of course, that any scientific statement must satisfy the criterion of falsifiability; i.e., a scientific statement must be testable and therefore could potentially be found false. In principle, this approach also defines the border between science and pseudoscience.

During his time, Einstein apparently was not overly concerned with this kind of criticism. He has been quoted saying, "It would not have required one hundred authors to prove me wrong; one would have been enough."[3] Clearly, the validity of scientific results is not decided by a majority vote, even though in today's environment support by colleagues and peers always helps. Nonetheless, it is undeniable that sometimes a single voice can be louder than the rumbling of a crowd. ■

### Notes

1. Anectodal evidence indicates that this type of phrasing has been used multiple times in the past. Examples include Roy S. Durstine (an advertising specialist), George D. Aiken (acting chairman of the Senate agricultural committee in 1947), and Earl Landgrebe (former member of the U.S. House of Representatives in 1974, in conjunction with the impeachment of Richard Nixon); see https://quoteinvestigator.com/2013/02/13 for background information and references.

2. Jung et al. (2001) reports that this phrase can be attributed to Wolfgang Pauli, an (originally) Austrian theoretical physicist known for his numerous contributions to quantum mechanics. It is conveyed that Pauli said in his native German, *"Das ist nicht nur nicht richtig; es ist nicht einmal falsch!"*

3. Due to the lack of a primary source, it is unclear if Einstein made this kind of statement. Hawking (1988), a secondary source, claimed that Einstein said (or might have said), "If I were wrong, then one would have been enough!"

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Manfred Cuntz is a professor of physics at the University of Texas at Arlington (UTA), with a focus on astrophysics and astrobiology. He is the author of more than ninety peer-reviewed publications. He has also been involved in numerous education and public outreach initiatives. In 2020, he was admitted to UTA's Academy of Distinguished Teachers. Cuntz is bilingual in American English and German.

## Creationist Funhouse, Episode Five

# God's Pet Bunny

STANLEY RICE

*What* would it take? What *would* it take? What would it *take*? This is what some religious conservatives wanted to ask British biologist J.B.S. Haldane. What would it take to make him admit that evolution was wrong?

Haldane was one of the most colorful scientists of the early twentieth century. He made important discoveries that contributed to our understanding of population genetics, upon which our modern understanding of natural selection is based. He also wrote and spoke for popular audiences. But he was more than that. He was not just an evolutionary scientist but also an atheist. Even more than that, he was a communist, at least until the Soviet leadership turned against the science of genetics.

In short, the closer you are to being a creationist, the more reasons you would have for despising this man, especially because he didn't mind saying what he thought about religious people. His principal target for ridicule was his fellow academic Clive Staples Lewis, known as C.S. Lewis, still one of the most widely read Christian writers. Haldane wrote an article against Lewis titled "More Anti-Lewisite," which refers to a poison gas from World War I. Lewis was not, as far as I can tell, a young-earth creationist. But it was enough for Haldane that Lewis was simply a Christian.

Haldane knew as well as anybody that the evidence for evolution was multifaceted. It was not just that there was a lot of evidence, but there were a lot of *kinds* of evidence: from fossils to biogeography (as I will explain below) to genetics (Haldane's specialty). Scientific acceptance of evolution was

**Haldane knew as well as anybody that the evidence for evolution was multifaceted. It was not just that there was a lot of evidence, but there were a lot of *kinds* of evidence.**

the result of what has been called "consilience," the convergence of multiple *independent* lines of evidence. So, it would seem that to tear down the edifice of evolution, you would have to dismantle it one brick at a time—the same way the edifice was built up in the first place.

But Haldane took something of a risk. Though this is not in any of Haldane's published work, he reportedly told his friend and fellow evolutionary biologist John Maynard Smith about it. What would it take to cause the entire edifice of evolutionary science to come tumbling down like the city walls of Jericho or the temple walls of Gaza from the Old Testament stories? All it would take, Haldane indicated, was a Precambrian bunny.

A Precambrian bunny. That's all it would take.

Or a Precambrian mouse, cat, dog, squirrel, elephant, wildebeest, or in fact any mammal. Or a bird, snake, or frog. In short, any Precambrian land animal. Or, hell, why not a Precambrian fish? Say, a nice Precambrian shark.

A quick primer for those who don't know what *Precambrian* means: The layers of rocks with a lot of large animals in them extend back to about 540 million years ago, the begin-

ning of the Cambrian period. Geologists have given names to each of the periods of earth history. Some, like Cambrian, were named after places where they were first found (in this case, Cambridge); other examples include Jurassic (after the Jura Mountains of France) and Permian (after a city in Russia). Others, such as Ordovician, were named after Celtic tribes. Some, such as the Carboniferous or Cretaceous, were named after some important feature about the deposits (coal and chalk, respectively). These names are not arbitrary divisions. Each transition, from one period to the next, was marked by a major catastrophe on earth, resulting in a measurable increase in the rate of extinction. This was especially true of the end of the Permian, when over 90 percent of species became extinct, and the end of the Cretaceous, when an asteroid slammed into the earth.

**Each transition, from one period to the next, was marked by a major catastrophe on earth, resulting in a measurable increase in the rate of extinction.**

The Precambrian was just the time of earth history before the Cambrian and before there were very many fossils. There are Precambrian fossils, but they are rare and hard to see. The period of earth history from the time it formed until the Cambrian period—which is over 80 percent of earth history—gets lumped into this Precambrian category. This does not mean that conditions were soporifically uniform during the Precambrian. Scientists now know that, on three separate occasions during the Precambrian, the earth almost froze over. These were the three "Snowball Earth" periods. Sometimes it was very hot and sometimes very cold, but there were no plants larger than seaweeds and no animals larger than worms.

Precambrian strata have no large animal fossils because large animals had not evolved yet. But if the Precambrian strata, like all the others, were produced by a flood that occurred on an earth that was already filled with plants and animals that God had created a couple of thousand years earlier, then surely there would be some large animals in the Precambrian layers.

If a worldwide flood occurred, the lowest fossiliferous layers might contain those organisms that were already in low-lying areas, and the highest fossiliferous layers would contain those organisms that either lived higher up on land or could run away from the flood waters better. A flood might therefore have produced a fossil record with mostly fish on the bottom and mostly mammals on the top.

But not perfectly. You would expect that the raging flood waters would have drawn large animals down into the bottom layers. Just one. Just one Precambrian bunny. That's all it would take. But no one has found even one.

Many creationists believe that the Precambrian rocks were those that existed before the flood. This opens up new possibilities but doesn't change things very much—because there aren't any *Cambrian* bunnies either. There are Cambrian fishes. But none of them have jaws.

It gets even more interesting with plants. In case you think that *nothing* could get more interesting with plants, I wish to remind you that I am a botanist. If you think plants are boring, you can read some of my books or visit the website of the Botanical Society of America or, if you are unwilling to do any of these things, you can stop reading right now. No hard feelings, you animal chauvinists. But really, let me explain.

If all the fossil deposits resulted from a flood, you might expect wetland plants to be at the bottom and mountain plants to be at the top. And, in fact, the oldest plant fossils are from wetlands. *Voilà!* But not so fast. Consider the small wetland plants of the Ordovician and Silurian periods. *None*

Fossil of the periderm of a lepidodendrid tree in sandstone near Tulsa, Oklahoma. Note the parallel lines and the leaf scars, only rarely found in modern trees.

*of them* are the flowering plants that are the most abundant plants on the earth today. Find me a Silurian weed from, say, the aster family or the mustard family. Today, wetlands have little pickleweeds in them, from the spinach family of flowering plants. Yet somehow there were no plants that had flowers in the Ordovician or Silurian wetlands. And what about the swamp forests of the Carboniferous and Devonian periods? Modern swamps have a lot of flowering plants in them. But back in the Carboniferous and Devonian periods, the trees were all tree-sized clubmosses, tree-sized ferns, or primitive conifers. No flowering plants at all—none.

And in those Devonian sedimentary layers, you find, near the bottom, amphibian-like fish, near the top, fish-like amphibians, and right in the middle, animals such as *Tiktaalik roseae* that were as close as you can get to a half-fish, half-amphibian.

So, in a big flood, you might have ended up with a general pattern of aquatic or wetland plants and animals near the bottom and of dry land plants and animals near the top. But it took the special work of God to make sure the pattern was a perfect match to the evolutionary pattern that we see in the fossil layers today—work not mentioned in the Bible.

And in case you think it was only macroscopic organisms and fragments, such as fish and leaves, that God sorted out into a fake evolutionary order, consider that he also did it with microscopic organisms. Take, for example, microscopic single-celled algae known as foraminiferans—or forams for short. Forams have calcium carbonate shells around them, which persist after the foram cell has died. And they are abundant. Nearly every marine fossil deposit has foram fossils in it. The foram shells come in many intricate and exquisite shapes, which allow scientists to distinguish the different species. Each species of foram is associated—some more strongly, some less—with its own particular time and place in the history of the earth. Scientists can reconstruct the timing and location of marine sedimentary deposits by studying the kinds of forams that they contain. You would not expect them to appear in the fossil record in a uniform order, like doodads on a blanket. You would expect them to be random, like stars in the sky. God must have scooched the forams around to have an evolutionary orderliness for some curious reason.

**God must have scooched the forams around to have an evolutionary orderliness for some curious reason.**

It wasn't your normal day in Texas, even for about 2000 BCE. For one thing, it was in the middle of the flood of Noah. Now, you probably think that on this day the flood covered the whole earth, which is what the Bible says according to the fundamentalists. But apparently there was a mountain or hill in what is now Texas, where some dinosaurs were hiding out. There were at least two species of dinosaurs there. One was a herd of giant vegetarian sauropod (think of the brontosaurus as a related species) now called *Paluxysaurus*. And there were smaller carnivorous dinosaurs similar to T. rex, now called *Acrocanthosaurus.* The sauropods came out for a stroll; they were not running. The little carnivores may have been hunting them but were not running as fast as they could.

This was odd because all around them the flood was raging.

How do we know all this? Because the dinosaurs left their footprints. And not just footprints but entire trackways. You can see the footprints today in the limestone bed of the Paluxy River near Glen Rose, Texas, at Dinosaur Valley State Park southwest of Ft. Worth. I am grateful to independent scientist Glen Kuban, who has studied these trackways for decades, for teaching me about them.

Dinosaurs left footprints in the limestone bed of the Paluxy River in Texas. Independent scientist Glen Kuban has studied these trackways for several decades.

From fossil bones in other locations, we know how big these dinosaurs were. And from how far apart the footprints are from one another, we can tell how rapidly, relative to body size, the dinosaurs were walking. Some of the little carnivores were running, but for the sauropods, it seemed to just be an

ordinary day.

Now consider how odd this had to be. The dinosaur footprints are in limestone, which is a sedimentary rock, and the limestone layer overlies many other sedimentary layers that were, according to creationists, deposited by the flood. Then, after the dinosaurs walked in the mud, the flood resumed and deposited more layers of limestone over the layer with the footprints in it. In the park today, you can see a lot of limestone layers, but most of those layers contain no footprints. So here's the creationist story: the flood deposited hundreds of feet of sediment, then just briefly the waters receded and the dinosaurs came out of their hidey holes and walked around, then the sun came out enough to dry the mud so that when the flood waters came back and deposited more layers of mud, the footprints would not be obliterated.

Where were the dinosaurs hiding during the flood? And what held the flood waters back long enough for the dinosaurs to come out and romp around? Well, I suppose it had to be God. He must have created a small, shining space of peace, order, and sunshine during the flood, and the dinosaurs walked on Cretaceous mud, under which was Jurassic and Triassic mud. And then God let the flood rush back in and bury the dinosaur footprints under new layers of Cretaceous mud.

At last the great day came, and Noah, convinced by the dove with the olive branch that God had magically made olive trees grow to full size in just a few days' time, let the animals loose. And with a noise that would have made the Chisolm Trail sound like a puff of wind, out they went!

Where did they go?

You would expect that they would have dispersed away from the Ark—which the Bible says landed on Mt. Ararat in what is now Turkey—and kept going until they found a suitable habitat. Some, such as woolly mammoths, would have headed north (only to promptly become extinct—but not to leave any skeletons en route from Ararat to Siberia! No! They all waited until they got to places such as Siberia to die), while jungle animals such as monkeys would have headed south.

Creationists, as it turns out, do not believe that every species, as we recognize them today, was separately created. Genesis says *kinds*, not species, were created. How do species and kinds (*baramin*, in Hebrew) differ? That is the basis of a whole "science" that you have never heard of because only creationists practice it: *baraminology*.

That is, you would expect to find a *Turkocentric* model of animal biogeography. (Biogeography is the science of where species live and how they got there, based largely on the pioneering work of Darwin's younger colleague Alfred Russel Wallace.) You read it here first: I believe I am the first person to have used the term *Turkocentric* in print, unless it is in an obscure creationist publication. It means that animal species would be arranged on earth radiating outward from an Ararat point of origin. And while creationists are studying baraminology, why not study *araratology* at the same time and propose an *araratocentric* model? I made those terms up too.

Both Darwin and Wallace, in their separate travels, observed many biogeographical patterns. Wallace noticed that

Cartoon by Loraine Thompson

the island of Bali had Asian mammals, while the island of Lombok (which is very close to Bali) had Australian mammals. The animals in the Amazon were almost all different from those in the jungles of Africa, which were in turn different from the jungles of India, which were different from those of Australia, which were different from those of Hawaii. Why? Because each set of animals evolved separately in or near the locations where they now live.

And there are local patterns of biogeography too. Spider monkeys and golden lion tamarins both live in South America. But spider monkeys live in the Amazon rainforest, while the tamarins live in coastal Atlantic rainforests.

The same pattern holds true for all major animal groups that live on continents that have been separated (according to scientific geology and continental drift) for millions of years. It is not true for continents that have been connected in the recent past. This is why many of the animals of northern Europe and Asia are similar (and in some cases, such as reindeer and elk, the same) as those in North America. Only about 20,000 years ago, the Bering land bridge connected Asia and North America and allowed large mammals to migrate.

The animal biogeography that people are most familiar with is the marsupials of Australia, such as kangaroos and their relatives. How many species of marsupials are there? A lot! Big ones, medium ones, and small ones. Some hop, some run, some burrow, some fly. You see, for almost any kind of placental mammal (that's the rest of us) that you could name, except for people, there is a marsupial counterpart. There are marsupial bats, moles, wolverines (the wombat), mice, dogs, cats, and squirrels (flying phalangers). Some of them have become extinct, but all these animals existed in recent centuries. Marsupials, just like placentals, live or lived in a wide range of habitats. Some, such as the red kangaroo, live in dry savannas, while some, such as the lethargic little koala, live in forests.

We could ask, from the viewpoint of evolutionary biogeography, how almost all the marsupials ended up in Austra-

lia (excepting the opossum). Well, as it turns out, marsupials evolved in the southern continents and placentals in the northern continents. When these continents came into contact, some of the placentals moved south, and some of the marsupials moved north. But whenever they came in contact, the placentals out-competed the marsupials. Therefore, marsupials became extinct in most southern continents as soon as there was contact with the north. This contact occurred three million years ago between North and South America, which were separate until the Isthmus of Panama rose from the sea. But it occurred much more recently in Australia—not from continental movement but from human contact. Two placental species (humans and dogs) arrived 60,000 years ago. The rest, such as cats and rats, arrived only about 350 years ago. And today in Australia, the marsupials are losing out. Placental dogs have helped lead the thylacine marsupial dogs into extinction. Placental cats spread, and dasyurid marsupial cats are becoming rare.

Plants, of course, show a similar pattern; the major plant families of the southern continents are not the same as those of the northern continents. And, once again, Australia is different: members of the myrtle family (such as eucalyptus) dominate its forests. Trees in the dipterocarp family dominate the rainforests of southeast Asia, so near to (and yet so different from) those of Australia. The succulent plants that dominate the deserts of North America are in the cactus family, but the succulents that dominate the deserts of Africa are in the milkweed and spurge families. And we are talking about a lot of species of myrtles, dipterocarps, cacti, spurges, and milkweeds. They all show this pattern. How could this pattern be explained by floating rafts of vegetation after the flood?

You can also find this pattern within groups of plants. Almost all oaks are native to the northern continents, but you will find different species of oaks in different regions. The evolutionary explanation is that the first oaks evolved when the northern continents were still connected and covered with continuous forest, about 70 million years ago. Then the North Atlantic Ocean began to form (the South Atlantic had begun to form earlier), causing Europe and North America to separate. Meanwhile, the Rocky Mountains and the Sierra Nevada rose, dividing the deciduous forests of North America into eastern and Californian forests. During the last 70 million years, separate species of oaks have evolved in Europe (e.g., the English oak), eastern North America (e.g., the bur oak), and California (e.g., the blue oak). Furthermore, in each of these places, species of live oaks (which keep their leaves in the winter) evolved independently: the cork oak in Europe, the live oak in eastern North America, and the coast live oak in California.

But according to the fundamentalists, we must instead accept an *araratocentric* model of animal biogeography. But to do this we must explain how all those marsupials, after emerging from the Ark, went straight to Australia, except for opossums. (There are quite a few South American opossums as well as the North American Virginia opossum.)

Question: How did the marsupials get to Australia?
Answer: They hopped.

This was the way I began a review of a revised edition of creationist John C. Whitcomb's book about Noah's flood, *The World That Perished*. In the original edition, he didn't really explain it. In the new edition, he added a sidebar that said that a shallow sea (a continental shelf) connected Australia with Asia, and if in the past sea levels were lower, the kangaroos could have hopped into Australia.

**Question: How did the marsupials get to Australia?
Answer: They hopped.**

But that is not the point. We are not asking about the mechanism of locomotion (how) but what caused the pattern (why). Apparently, were it not for God's miraculous efforts, we would see a *Turkocentric* and *araratogenetic* (another new word!) model of animal biogeography.

After all this hard work putting the geological and biogeographic records into order, it is regrettable that God had to wait so many thousands of years before anyone would appreciate the nuances of his work. In the Middle Ages in Europe, when people saw fossils of seashells, they assumed that they were just rocks that happened to look like seashells. It did not occur to them that fossils actually had been seashells at one time. One of the early scholars to recognize fossils was the Danish geologist Niels Stensen (Latinized to Nicholas Steno) in the early seventeenth century. Gradually, all scientists came to accept that if you see a rock that looks just like a seashell, it probably *was* in fact a seashell a very long time ago. God had to wait almost four thousand years before scientists (or anybody else) could appreciate his hard work with fossils, making everything look exactly like it would through evolution. And it took even longer before explorers began to notice biogeographic patterns in the modern world.

In the next episode, we will discover how God manipulated all the DNA in all the cells in the world to trick us into believing that evolution occurred. Quite a task, but he was up to it! ■

Stanley Rice is professor of biological science at Southeastern Oklahoma State University and the author of five popular science books, most recently *Scientifically Thinking: How to Liberate Your Mind, Solve the World's Problems, and Embrace the Beauty of Science*. He has been dealing constructively with creationism as a college science educator for three decades. His author website is www.stanleyrice.com.

# The Scientist's Skepticism

There are two kinds of skepticism. Only one is part of the scientific outlook.

MARIO BUNGE

*To honor the great philosopher of science and CSI Fellow Mario Bunge, who died February 24, 2020 (see SI, July/August 2020), we here republish one of his classic articles from* Skeptical Inquirer, *explaining the type of skepticism all good scientists and skeptics use. We first published it in our Summer 1992 issue, but it is just as relevant today.*

Those of us who question the beliefs in ghosts, reincarnation, telepathy, clairvoyance, psychokinesis, dowsing, astral influences, magic, witchcraft, UFO-abductions, graphology, psychic surgery, homeopathy, psychoanalysis, and the like, call ourselves "skeptics." By so doing, we wish to indicate that we adopt Descartes's famous methodical doubt. This is just initial distrust of extraordinary perceptions, thoughts, and reports. It is not that skeptics close their minds to strange events but that, before admitting that such events are real, they want to have them checked with new experiences or reasonings. Skeptics do not accept naively the first things they perceive or think; they are not gullible. Nor are they neophobic. They are just critical; they want to see evidence before believing.

## Two Kinds of Skepticism

Methodical doubt is the nucleus of *methodological skepticism.* This kind of skepticism must be distinguished from *systematic skepticism*, which denies the possibility of any knowledge and therefore entails that truth is inaccessible, and the search for it vain. The skeptics of both varieties criticize naiveté and dogmatism, but whereas methodological skepticism urges us to investigate, systematic skepticism blocks research and thereby leads to the same result as dogmatism, namely, stagnation or worse.

The craftsman and the technologist, the manager and the organizer, as well as the scientist and the authentic philosopher, behave as methodological skeptics even if they have never heard about this approach—and even if they behave naively or dogmatically after work hours. In fact, in their professional work they are not gullible, nor do they disbelieve everything, but they mistrust any important idea that has not been put to the test and demand the control of data as well as the test of conjectures. They look for new truths instead of remaining content with a handful of dogmas, but they also hold certain beliefs.

For example, the electrician makes some measurements and tests the installation before delivering it; the pharmacologist tests the new drug before advising to proceed to its manufacture in industrial quantities; the manager orders marketing research before launching a new product; the editor asks for advice of referees before sending a new work to the printer; teachers test their students' progress before evaluating them; mathematicians attempt to prove or disprove their theorems; physicists, chemists, biologists, and psychologists design and redesign experiments by means of which they test their hypotheses; the sociologist, serious economist, and the political scientist study random samples of the populations they are interested in before announcing generalizations about them—and so on. In all these cases, people search for truth or efficiency and, far from admitting uncritically hypotheses, data, techniques, and plans, they bother to check them.

On the other hand, the theologians and school philosophers, the neoclassical economist and messianic politicians, as well as the pseudoscientists and counterculture gurus, indulge in the luxury of repeating dogmas that either are untestable or have failed rigorous tests. The rest, those of us who make a living working with our hands, producing or diffusing knowledge, organizing or managing organizations, are supposed to practice methodological doubt.

Methodological skepticism is a methodological, practical, and moral stance. Indeed, those who adopt it believe that it is foolish, imprudent, and morally wrong to announce, practice, or preach important ideas or practices that have not been put to the test or, worse, that have been shown in a conclusive manner to be utterly false, inefficient, or harmful. (Note the restriction to *important* beliefs; by definition, trivialities are harmless even when false.)

Because we trust research and action based on research findings, we are not systematic skeptics. We disbelieve falsity and suspend judgment concerning whatever has not been checked, but we believe, at least temporarily, whatever passed the requisite tests. At the same time, we are willing to give up whatever beliefs prove to be groundless. In sum, methodological skeptics are constructive. …

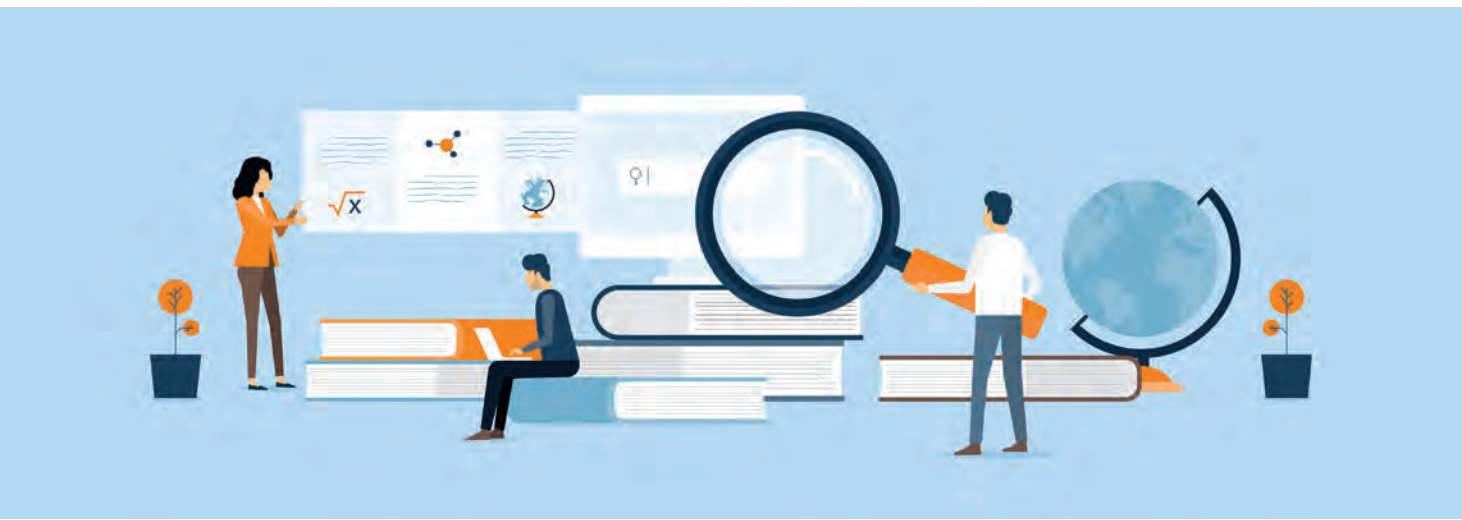
### The Scientist's Skepticism

It is impossible to evaluate an idea in and by itself, independently of some system of ideas that is taken as a basis or standard. When examining any idea, we do so in the light of further ideas that we do not question at the moment; absolute doubt would be as irrational as absolute belief. Hence systematic or radical skepticism is logically untenable. By the same token, every methodological skeptic has some creed or other, however provisional it may be.

For example, we evaluate a mathematical theorem in light of its premises and the laws of logic—and in turn the latter are evaluated by their fertility and consistency with mathematics. We judge a physical theory by its logical consistency and its mathematical tidiness as well as according to its harmony with other physical theories and its correspondence with the relevant empirical data. We evaluate a chemical theory according to the physical theories it takes for granted and according to whether or not it jibes with other chemical theories as well as with the relevant experimental data. We proceed in a similar manner with the remaining sciences. In particular, we demand that psychology does not violate any biological laws and that the social sciences respect psychology and harmonize with one another. (The fact that mainstream economics and politology do not care for other social sciences is precisely a point against them.)

In other words, the scientist's skepticism is methodological and partial, not systematic and total. Serious researchers are neither gullible nor nihilistic; they do not embrace beliefs uncritically, but do admit, at least until new notice, a host of data and theories. Their skepticism is constructive, not just critical.

Moreover, in every case the methodological skeptic presupposes—albeit seldom explicitly—that scientific theories and methods satisfy certain philosophical requirements. These



are *(a) materialism*: everything in the universe is concrete or material, though not necessarily corporeal, and everything behaves lawfully; *(b) realism*: the world exists independently of those who study it, and moreover it can be known at least partially and gradually; *(c) rationalism*: our ideas ought to be internally consistent and they should cohere with one another; (*d) empiricism*: every idea about real things should be empirically testable; and *(e) systemism*: the data and hypotheses of science are not stray but constitute a system (for details, see Bunge 1983a, 1983b).

No doubt, few scientists realize that these five principles are indeed presupposed in scientific research. However, it does not take much to show that *(a)* if any of the preceding principles were relinquished, scientific research would miscarry, and *(b)* the main difference between science and pseudoscience is not so much that the former is true and the latter false, but that pseudoscience does not abide by those principles—as a consequence of which it seldom delivers truth and it never corrects itself.

Not all skeptics share these philosophical principles. Most of them believe that only scientific method applied to data-gathering is required to conduct scientific research. However, it is possible to apply the scientific method to a nonscientific investigation, such as trying to measure the speed of ghosts or the intensity of the action of mind on matter. To yield knowledge, the scientific method must be accompanied by a scientific worldview: materialist, realist, rationalist, empiricist, and systemic. This is the core of the skeptic's credo.

## Conclusion

Methodological skeptics are not gullible, but they do not question everything at once either. They believe whatever has been demonstrated or has been shown to have strong empirical support. They disbelieve whatever clashes with logic or with the bulk of scientific knowledge and its underlying philosophical hypotheses. Theirs is a qualified, not indiscriminate skepticism.

The methodological skeptics uphold many principles and, above all, they trust humans to advance even further in the knowledge of reality. Their faith is critical, not blind; it is the explorer's faith, not the believer's. They do not believe anything in the absence of evidence, but they are willing to explore bold new ideas if they find reasons to suspect that they have a chance (see, for example, Bunge 1983c). They are open-minded but not blank-minded; they are quick to filter out intellectual rubbish.

For example, methodological skeptics find no reason to engage in experimental investigations before denying that pure thought may energize machines, that surgery can be performed by sheer mental power, that magical incantations or solutions of one part in ten raised to the 100th power have therapeutic power, that perpetual-motion machines can be built, or that there are solve-all theories. All such beliefs can be demolished by wielding some well-tested scientific or philosophical principles. This strategy is certainly cheaper than naive empiricism.

**The scientist's skepticism is methodological and partial, not systematic and total. Serious researchers are neither gullible nor nihilistic. . . . Their skepticism is constructive, not just critical.**

To conclude: Pseudoscience and pseudotechnology are the modern versions of magical thinking. They must be subjected to critical scrutiny not only to clean up culture but also to prevent quacks from cleaning out our pockets. And to criticize them it is not enough to show that they lack empirical support—for, after all, one might believe that such support could be forthcoming. We must also show that those beliefs in the arcane or the paranormal clash with either well-established scientific theories or fertile philosophical principles. For this reason, the criticism of magical thinking should be a common endeavor of scientists, technologists, philosophers, and educators. Given the massive commercial exploitation of junk culture, as well as the current decline in the teaching of science and technology in numerous countries, unless we work harder on debunking pseudoscience and pseudotechnology, we shall be in for a sharp decline of modern civilization (Bunge 1989). ■

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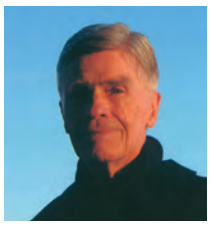
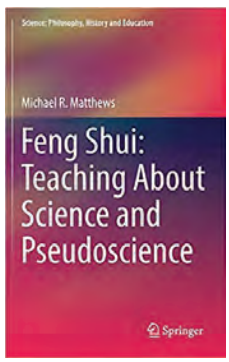


Mario Bunge, who died in February 2020 at the age of 100, was both a physicist and a philosopher. He spent many decades in the Foundations and Philosophy of Science Unit at McGill University in Montreal. This article was excerpted by permission from "A Skeptic's Beliefs and Disbeliefs," the lead article of a special issue of *New Ideas in Psychology* devoted to "Mario Bunge on Nonscientific Psychology and Pseudoscience: A Debate" (vol. 9, no. 2, 1991). That journal's editor at the time, Pierre Moessinger, wrote in a leadoff editorial, "Mario Bunge is one of the few great philosophers of science of our times. More precisely he is both a philosopher and a scientist. … What is so extraordinary about Bunge is the breadth of his intellectual interests and his ability to coordinate and synthesize problems." Bunge's paper was originally presented at a CSICOP conference on "Magical Thinking and Its Prevalence in the World Today" in Mexico City in 1989. Bunge was a longtime CSICOP/CSI fellow and frequent contributor to Skeptical Inquirer.

# Examining a 3,000-Year-Old Pseudoscience

TERENCE HINES


Science: Philosophy, History and Education
Michael R. Matthews
Feng Shui: Teaching About Science and Pseudoscience
Springer

*Feng Shui: Teaching about Science and Pseudoscience*. By Michael R. Matthews. Berlin, Germany: Springer. 2019. ISBN 978-3-030-18821-4. 340 pp. Hardcover, $119.99.

If you think of feng shui (which translates literally as "wind water") as nothing more than a silly furniture-arranging gimmick gussied up with bogus Eastern trappings, you'll be surprised, as I was, that anyone could write a 340-page critical book on the topic. Michael R. Matthews, a professor of education at the University of New South Wales (who also recently wrote the obituary of centenarian philosopher Mario Bunge in the July/August 2020 SI), has written a comprehensive review of the history and practice of feng shui. Feng shui "is a multibillion-dollar industry, affecting millions of people. It has medical, health, architectural, building construction, town planning, interior design, and divination components" (269).

The first section, "Feng Shui: Educational Responsibilities and Opportunities" contains two chapters. The first is a brief introduction showing that feng shui is

> concerned with identifying, manipulating, and utilizing the supposed all-encompassing flow of chi, the putative universal life force (sometimes rendered as "vital force"), so that people's environments, homes, workplaces, social places, and, indeed, their own bodies can be brought into harmony with it and thus made more natural and healthy. (5)

In the second chapter, Matthews argues that including feng shui in discussions of what is and is not science can be an important learning experience.

Section two is titled "Feng Shui: Its Theory and Practice." Feng shui has a history in China going back some 3,000 years and is still widely influential there where "countless millions have relied on feng shui astrological guides to make business decisions … the timing of significant personal and family events" and to "guide their decisions in romantic and personal life" (65). Huge sums are spent on feng shui consultants by architectural and construction companies. Several buildings in Hong Kong had to be designed with huge holes in the upper stories so as not to interfere with the passage of chi from one location to another as required by feng shui (see below). Feng shui consultants have been sued when a building built to their specifications was not as financially successful as hoped. What amounts to extortion has occurred because of claims that new construction has interfered with someone's chi. (For more on this, see Stuart Vyse's "Superstition and Real Estate, Part I: The Chinese Market" in the May/June 2020 Skeptical Inquirer.)

An example of a building designed by feng shui principles. The hole is there to allow the passage of chi.

The second section also describes the relationship between feng shui and the I Ching, the yin-yang dichotomy, and traditional Chinese medicine (TCM). The latter is largely based on manipulating chi, a practice known as qigong. Chapter 5 covers two of the most popular traditional Chinese medicine practices: reiki and acupuncture. The chapter provides a short review of the results of studies of these techniques. The official support that the Chinese government has given to traditional Chinese medicine has led to outright suppression of skepticism regarding its benefits. Matthews rightly attributes the fact that nearly 100 percent of Chinese studies of TCM report positive results to fakery and government pressure to provide positive results.

The third section, "Feng Shui: A Historical-Philosophical Narrative," contains four chapters. Chapter 6 concerns Matteo Ricci (1552–1610), a Jesuit missionary in China who was close to the imperial court and "one of the

first Europeans to give an informed and detailed appraisal of feng shui" (116). Chapter 7 deals with Ernst Johann Eitel (1838–1908), who spent considerable time in China and commented at length on feng shui. He noted that when Europeans began building structures in Hong Kong, they were initially thought to have knowledge of feng shui because they built in places that a feng shui practitioner would have built. They in fact relied on common sense: don't build your house in a swamp, for example, and don't build a railroad on a mountain side where there is likely to be an avalanche. So feng shui may have started as nothing more than the common sense and experience of skilled craftsmen.

Eitel attributes, as does Matthews, the staying power of feng shui to the lack of experimental research in traditional Chinese science. That science was geared toward extremely practical solutions to problems, and little time or effort went into explorations of theoretical aspects of science that lead to real understanding. After this major point is made, chapter 7 wanders a bit with discussions of several topics only tangentially related to feng shui.

Chapter 8, "Science, Westernization, and Feng Shui in Early Twentieth-Century China," says very little about feng shui. Chapter 9 outlines the changing government attitude about feng shui. In the 1940s, no less a personage than Mao Tse-tung banned the practice. But feng shui is now widely used and supported by the government in China due to its connection to chi.

The four chapters in section 4, "Feng Shui: Considerations from Philosophy of Science," are an uneven group. The first, chapter 10, "Joseph Needham on Feng Shui and Traditional Chinese Science," continues the discussion of why Chinese science did not embrace the experimental approach as seen in the West. It is an interesting chapter, but feng shui is little mentioned until the end—and then only in passing.

Chapter 11, "The Science and Teaching of Energy," contains more discussions of topics minimally related to feng shui and chi. It starts with a brief history of the definition of *energy*, conservation of energy, and momentum. This is relevant only to the extent to which the usual translation of *chi* is the English word *energy*, but that extent is small. The discovery of oxygen is also described. These discussions are largely irrelevant and are out of place in a book on feng shui. At the very end, there is a discussion of using the example of feng shui in courses on the history and philosophy of science and the multicultural issues that could arise when using feng shui as an example of pseudoscience.

Chapter 12, "Scientific Testing of Chi (*Qi*) Claims," raises the question that will probably be foremost in the minds of readers of the Skeptical Inquirer: Have there been adequately controlled tests of feng shui and related chi, and, if so, what are the results? Briefly, there have been no such tests. There were, in the 1980s and 1990s, extravagant claims for the powers of chi made in China by "Dr." Yan Xin. During a U.S. tour in 1990, he was said to have "projected his *qi* power to make two wheelchair-bound people walk for the first time in many years" (250). It was claimed that "Yan's self-generated *qi* affects molecular structure and behaviour at a distance of 10,000 km, across a continent and across the Pacific Ocean. Remarkably scientists from half-a-dozen reputable universities signed off on this, and it was published in a supposedly scientific journal" (252).

No proof has ever been produced for *qi* in general or feng shui in particular. If this type of energy were so powerful, it would be child's play to demonstrate its reality. Why did no Chinese James Randi emerge to challenge these claims and put them to the test? (As Randi himself did in 1988 in CSICOP's visit to China, see "Testing Psi Claims in China: Visit of CSICOP Delegation," SI, Summer 1988.) Because the concept of *qi* had then (and still has) the backing of the Chinese government, any would-be Chinese version of Randi would have been fired, banished, imprisoned, or killed by the government for any attempt to discredit Yan, similar frauds, *qi*, or feng shui. One way of testing feng shui would be to see if different practitioners come to the same conclusions about, say, the proper arrangement of buildings in a new development or furniture in a house. Despite the simplicity of doing so, no such formal study seems to have been done. I doubt that any feng shui practitioners would agree to take part because practitioners have an "aversion to testing" (8), a characteristic of a pseudoscience.

Matthews largely ignores the basis for the judgments made by feng shui practitioners. Is it all based just on intuition? Or are there rules involved that might, at least partially, result in agreement between different practitioners? It would have been important to have a discussion of how practitioners arrive at their conclusions.

The penultimate chapter considers whether feng shui is a pseudoscience and begins with a discussion of how to separate real science from pseudoscience. Matthews considers feng shui using the criteria for pseudoscience advanced by philosophers who believe it is both useful and possible to make such a distinction. He concludes that feng shui "practitioners individually and as a community do not have a scientific habit of mind" and that "historical, sociological, economic, and psychological perspectives on feng shui show the whole belief system has been and is exploited for fraudulent purposes" and that feng shui "is pseudoscience not science" (288–289).

Matthews has produced an important book. His coverage of the historical and cultural aspects of feng shui, especially the early Western evaluations, is excellent. The book is not without its flaws; as noted, some sections are irrelevant, and a stronger editorial hand would have eliminated them. ■

Terence Hines is professor of psychology at Pace University and author of *Pseudoscience and the Paranormal.* He is a Committee for Skeptical Inquiry fellow.

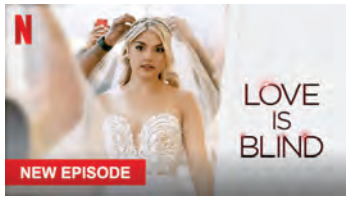
# *Love Is Blind* Is Blinding Us with 'Science'

Minjung Park and Craig A. Foster

*Love Is Blind* is the latest hit in reality television. The show is wildly entertaining, but this new twist on reality-show dating markets itself as a science experiment. This could kill people.

*Love Is Blind* takes good-looking single people and places them in "pods." The pods are equipped with food, snacks, and, of course, alcohol. The poddy people then communicate through shared walls. This allows them to "date" others without seeing their dates' physical appearance. Participants are only allowed to literally see their partners if they become engaged during the show. Couples then have some time to get to know each other face-to-face before a climatic wedding ceremony in which partners can decide to tie the knot or cut bait.

By marketing this gimmick as an experiment, *Love Is Blind* makes science look like a bunch of poorly cooked spaghetti that any fool could throw at a wall. This subtly—or perhaps not so subtly—makes it easier for people to dismiss science that they just don't like. If this seems overstated, consider this: The president of the United States—again, *the president of the United States*—retweeted a former game show host's opinion about COVID-19. Move over, Dr. Fauci! The host of *Love Connection* has something to say.




*Love Is Blind* (television series). Netflix. Chris Coelen, creator and executive producer. First airdate February 13, 2020.

### An Out-of-Control Scientific Dumpster Fire

*Love Is Blind* basically hypothesizes that long-term romantic relationships would be more successful if individuals cannot see their respective partners' physical appearance during early relationship development. But a real scientific experiment wouldn't look anything like the dating scenario that producers designed to get ratings rather than results. (See "Skepticism and Pseudoexperiments," SI, September/October 2020.)

Real social scientists, at least good ones, would randomly assign participants into one of two groups. One group would be the experimental condition; participants in this condition would date without being able to see their potential partners' physical appearance. The other group would be the control condition; participants in this condition would be able to see their partners' physical appearance, but everything else would be similar to the experimental condition.

*Love Is Blind* has no control condition; all participants experience the strange, wholly artificial dating conditions constructed by the show. Accordingly, even if the *Love Is Blind* relationships appeared to be unusually successful, nobody would know whether the effect was due to the concealment of physical appearance gimmick or to one or more other factors.

For instance, participants were surely bombarded by camera operators, assistants, stylists, and so forth, all of whom could explicitly or tacitly encourage (or discourage) true romance. Those "deep emotional reveals" that fast-forward relationship intimacy? They were almost certainly encouraged by producers. Genuine social scientists try to minimize their influence on participant behavior, hence the use of unobtrusive two-way mirrors.

And most partners don't begin dating at swanky, all-inclusive locations. That could easily make any relationship feel a lot more fun than trying to pay for an expensive meal and still have enough money left over for rent.

Perhaps the oddest addition, from a scientific standpoint, is the required wedding ceremony where couples marry or put the relationship on ice. This introduces a seriously uncomfortable element that has nothing to do with the show's main concept. Slowing down relationship development is tough enough; there's no need to make people do it publicly on the altar.

### Couples Have the Same Relationship Problems Anyway

Another problem is that even if the *Love Is Blind* method of creating love is truly effective, the effect will be difficult to detect. *Love Is Blind* couples encountered several relationship challenges that had nothing to do with visible hotness or notness—challenges that, by the way, are supported by legitimate science.

Take, for example, Carlton revealing his bisexuality to Diamond. Carlton and Diamond started discussing this issue, but they both became defensive. This

moved their relationship problem-solving from constructive to destructive. Damian didn't like the amount of time Giannina was on her phone. Damian brought this up, but he was unable to give Giannina a sense of unconditional positive regard—that he valued and respected her regardless of her phone-friendly behavior. This made her feel judged and uncomfortable and likely inhibited her ability to get conjugal leave from her cell.

Extraneous influences such as these do not negate the merit of a scientific investigation, but they generally necessitate the inclusion of many participants, far more than the paltry number offered by the show. Greater sample size allows researchers more fidelity in examining whether the independent variable (*Love Is Blind* dating versus normal dating) influenced the dependent variable (relationship success).

### This Scientific Fantasy Is Not So Sweet

Ironically, even if social scientists wanted to test the *Love Is Blind* supposition, they couldn't create anything like the show due to ethical considerations. Social scientists submit their research proposals to review boards; these boards ensure that participants are treated ethically and fairly.

That scrutiny prevents real scientists from placing participants in unjustifiably uncomfortable situations. In contrast, reality show producers profit by manipulating participants' emotions, recording the outcomes, and sharing it with the public as entertainment fodder.

Despite these concerns, we are not calling on people to cancel the show. Viewers can enjoy *Love Is Blind* for dramatizing possibly authentic relationships between aspiring D-list celebrities or people who somehow believe that reality television is the most effective path to true love. It's just important to recognize that real science involves a careful and ethical process conducted by experts who scrutinize each other's work. It isn't conducted by producers who have millions to gain if they can get enough hookups and breakups to keep ratings up.

And don't think this is just overly sensitive whining from a couple of nerds who read texts rather than sexts. People believe all sorts of myths about human psychology. They also doubt established scientific principles such as human-caused climate change, the benefits of vaccination, and the shape of Earth. Now we can add to that mix the doubt about COVID-19's legitimacy and the benefits of wearing masks. Fewer masks means more contagion, illness, and death. At least that's what scientists tell us.

We can't stop the media from producing shows and marketing poor science as real science. We can, however, learn the distinction between real science and reality television shows that claim to be scientific. This would create the best of both worlds: viewers can respect science for being a careful process that establishes reliable scientific laws and enjoy reality television shows as entertainment with obvious scientific flaws. ■

Minjung Park is a first-class cadet at the United States Air Force Academy. She is majoring in behavioral sciences and leadership. She plans to serve in the United States Air Force as an information operations officer.

Craig A. Foster is a professor and chair of the Psychology Department at SUNY Cortland. Foster received his PhD in social psychology from the University of North Carolina. His research interests include the development of pseudoscientific beliefs and scientific reasoning.

## NEW AND NOTABLE]

*Listing does not preclude future review. Written by* Skeptical Inquirer *Editor Kendrick Frazier*

**THE STATE OF SCIENCE: What the Future Holds and the Scientists Making It Happen.** Marc Zimmer. Zimmer, a writer and chemistry professor at Connecticut College, likens his book to an annual report on the state of science from a working scientist, "a view from the trenches." But far from a bureaucratic report, it is filled with lively commentary and analysis, and its opening chapters have sections on challenges to science and on fake news and pseudoscience. After interesting sections on "Doing Science," "Old Science," and "New Science" (LIGO and gravitational waves, deep learning, optogenetics, and CRISPR), he returns to these troubling themes with a three-chapter section titled "Bad Science." Here he addresses the problems of selective mistrust or denial of science or worse. He focuses on three broad topics: "This Is Not Science, It Is Fake Science" (tobacco's war on science, fake news and the post-truth era, predatory journals); "This Is Science, Not Politics" (climate, anti-vaxxers, GMO foods); and "Quackery" (supplements, the stem-cell controversy, Dr. Oz, wellness, and more). In the end, Zimmer thinks the future of science is bright, but we have to learn how to channel future discoveries in positive directions and communicate with the public more effectively. Prometheus Books/Rowman & Littlefield, 2020, 224 pp., $26.95.

**WEIRD EARTH: Debunking Strange Ideas about Our Planet.** Donald R. Prothero. The author—a scientist, educator, and prolific skeptic writer (e.g. *Abominable Science!* and *UFOs, Chemtrails, and Aliens*)—here takes on the numerous weird, paranormal, and supernatural ideas people hold about the earth. They range from crank ideas about geology (hollow earth, flat earth, geocentrism, moon-landing hoaxes, expanding earth, myths about earth's magnetic field) to mystical and paranormal explanations of earth features (aliens at Mt. Shasta, ley lines, Atlantis, Lemuria), to mystical ideas about natural objects and processes (crystal healing, dowsing), to biblically based ideas about the great flood and a young age of the earth. Calling on his experience as a professional geologist and forty years of teaching college earth sciences, Prothero pungently dissects "why these weird ideas aren't real." In each chapter, he describes and critiques one of these ideas, and in many he adds a section titled "How Do We Know?" clearly outlining the scientific reasons for their invalidity. Couple this with an excellent opening chapter on "Science and Critical Thinking" and the concluding chapter on "Why People Want to Believe Weird Things," and we have a fine compendium not only of timely scientific critiques of wrong and pseudoscientific ideas about the planet we all live on but of pseudoscientific thinking in general. Red Lightning Books, 2020, 280 pp., $20.

## Coronavirus Crisis

Toward the end of his special report on the coronavirus crisis ("Coronavirus Crisis: Chaos, Counting, and Confronting Our Biases," July/August 2020), Benjamin Radford, in mentioning the public's blaming the media for misinformation, drops in the qualifier "—and often deservedly so—."

This phrase is fatally imprecise. Does this qualifier include all media (e.g., the *Lancet*, the *Journal of the American Medical Association*, or the *New York Times*)? Is he talking about misinformation in general or merely pertaining to the coronavirus? Is he endorsing the "Fake News" movement? Are the "lamestream" media truly the "enemy of the people?" What verifiable evidence does he have that "the news media" are "often deservedly" criticized for misinformation by the general public?

Such an imprecise, inflammatory, and unsubstantiated phrase should never make its way into Skeptical Inquirer.

Karl Felsen
Guilderland, New York

Radford's claim that "Both positions argue from a false certainty …" ("Coronavirus Crisis") is as false applied to the pandemic as it is applied to climate change. It misses the distinction between certainty in knowing the exact magnitude of the threat (precision), and certainty in knowing that the threat is serious and in knowing what measures can reduce the seriousness (accuracy). For both the pandemic and climate change, the basic science is known, and we do have data. Italy and Spain showed the hazard of not quickly reacting strongly and its impact on the pandemic after reacting. We similarly are getting the data on the ill effects of increasing temperatures. We do know enough to act.

Testing is useful, because it is not feasible for everyone to isolate. Food, water, power, healthcare, and so on requires people. Testing provides an added level of control for exposure.

The claim that "We can never know alternative history …" is too sweeping. We cannot make exact predictions, but we can make estimates of trends. Uncertainty should not be used as an excuse to claim total ignorance and ignore reasonable actions.

Robert Clear
Berkeley, California

*Benjamin Radford responds:*

*I thank Felsen for his comment and could not agree more. Indeed, I have written extensively about the difficulty in quantifying "the media." In both my special report and here, space prohibits an in-depth examination of the nature of "the media," but more can be found in my book* Media Mythmakers: How Journalists, Activists, and Advertisers Mislead Us *and in my CFI blog* A Skeptic Reads the Newspaper, *which routinely examines false and misleading information across a variety of media (see especially my 2014 post "The Myth of 'The Media,'" available online at centerforinquiry.org/blog/the_myth_of_the_media/).*

*Clear seems to have misunderstood my reference to "false certainty," which was not in the context of science but instead people underreacting or overreacting to the pandemic—that among those two groups, "both positions argue from a false certainty, a smugness that they know better than others do, that the Cassandras and Chicken Littles will get their comeuppance." The certainty I refer to is the certainty of the convictions that anti-maskers and doomsday preppers have about the truth of their own beliefs, which is influenced by many factors, including confirmation bias and insular social media algorithms. There's no implication that "we can never know alternative history" or that agnosticism is an appropriate response to COVID-19. As I wrote, "when it comes to life and death topics such as disease outbreaks, the medical community wisely adopts a better-safe-than-sorry approach" when faced with scientific uncertainty.*

## Can You Boost Immunity?

I'm a long-time subscriber. I expect and enjoy sharp criticism from you based on good evidence and clear thinking. Then I read Harriet Hall's column on boosting the immune system, in which she seems to claim you can't boost immunity, or if you do, it can be harmful ("How You Can *Really* Boost Your Immune System," July/August 2020). Hall, a retired doctor, claims that efforts by health practitioners using "fake claims" that "exercise and a good diet" have "nothing specific to offer the immune system." Dr. Hall backs up her claims by quoting extensively from what I can only imagine is her textbook from medical school. Since those enlightened days, science has made some progress in this area.

May I suggest that Dr. Hall read something published in the twenty-first century on this topic. How about an article in the most recent publication of *Scientific American* (July 2020) titled "How To Boost Your Immunity," which recommends such "voodoo" practices as good diet, regular exercise, and certain supplements such as zinc, vitamin C, and vitamin D.

I am eighty years old and still teaching high school, with no plans to retire. I eat a good diet, exercise regularly, and take the above supplements. I have not taken a sick day for years.

Joe Robinson
Newport Beach, California

I greatly appreciated Dr. Hall's timely and informative article. One sees many claims on the internet that "70% of the immune system is in the gut" along with advice on how to "strengthen" it. I'd love to see a discussion of that either as a response to this letter or as the subject of a future column.

Richard Kogut
Merced, California

*Harriet Hall replies:*

*Mr. Robinson says he read my column on boosting the immune system. His letter shows that either he failed to read it carefully or failed to understand it (probably both). My column explained why the measures claiming to boost the immune system can't be expected to do any such thing. The most they might accomplish is to increase the level of one component of a fiendishly complex system. That has never been shown to improve outcomes and conceivably might do more harm than good. I explained how the immune system can harm the body. Has he never heard of autoimmune diseases? I explained that exercise and a good diet are important for health in general but do nothing specific to improve immune function. Perhaps Mr. Robinson doesn't understand the meaning of the word* specific. *He could look it up in the dictionary. He accuses me of quoting from an old textbook. That is not only false but is a gratuitous insult. I didn't stop learning when I graduated from medical school. My column offered up-to-date scientific information. Instead of citing scientific studies to support his disagreement, he asks me to read a magazine article. There is no evidence that the supplements he takes "boost" the immune system or improve health outcomes for people whose diet is adequate, and his confidence that they benefited him is just an un-*

*substantiated belief. He says he hasn't taken a sick day for years, but he can't know whether that has anything to do with his "immune boosting" efforts. If he is a regular reader of* Skeptical Inquirer, *he should have learned by now that anecdotes don't count as "evidence."*

## Chemistry Misinformation

Excellent article, "Is Chemistry a Force for Good or Evil?" by Dr. Peter Lantos (July/August 2020). Hope he sees fit to continue contributing, maybe even on my favorite peeve: "organic" foods.

James Divine
West Richland, Washington

## Flat-Earthers

Glenn Blanch begins his review of *Falling Flat* by mentioning that there are "credible polls indicating that the level of acceptance of flat-earthery is about 1 percent in the United States" (July/August 2020).

I'm always intrigued by these polls because they so starkly contradict my own experience. Not only have I never personally encountered a flat-earther, but having discussed this with dozens of people now, I have yet to even find one within two degrees of separation from me. I'm careful not to claim that my own lived experience trumps representative polls, but it makes me wonder: How do pollsters account for inattentive, lazy, disinterested, or confused respondents? What about liars, bullshitters, or trolls (who together surely could push the 1 percent mark in the United States)? Is there any ridiculous opinion we can robustly find that significantly less than 1 percent of the population hold?

Flat-earthers seem to be everybody's metaphor for whichever group they disagree with, because even your opponent on creationism can agree with you that those flat-earthers are ridiculous, so you can safely use the subject to illustrate your loyalty to scientific principles, as the creationist author seems to be doing in *Falling Flat.* I suspect flat-earthers are barely more than a debate tactic, a vanishingly tiny population.

Michael Jones
St. Louis, Missouri

In a conversation with a flat-earth advocate, I asked:

"So, the Earth is flat?" Yes.

"And it's a disc rotating in space?" YES!

"So, what's on the other side?"

I left him dithering.

James C. Starbird
Van Buren, Arkansas

## Panda-Monium

Harriet Hall had me reaching for the reference book when she said that giant pandas are carnivores (Book Review, "Alternative Medicine: Placebos for Pets," July/August 2020). I thank her for the opportunity to improve my knowledge and think it might be somewhat misleading to say that giant pandas are carnivores, although they *are* certainly carnivorans.

As most people know, giant pandas mainly eat bamboo shoots and so are described as herbivores. However, it is also true that they are classified as part of the taxonomic order *Carnivora* whose members are formally referred to as carnivorans and less formally, and perhaps less helpfully, as carnivores. Many carnivorans are meat eaters but some are omnivores and some, like the giant panda, are herbivores. Similarly, just as not all carnivorans are meat eaters, so not all meat eaters are carnivorans. Whales are carnivorous mammals, but they are members of the order *Artiodactyla*, an order that includes giraffes and camels.

All of which might go to show that, while pandas are black and white, English usage can be more of a grey (U.K.) or gray (U.S.) area.

Martin Stubbs
London, United Kingdom

## Why Happier?

The letter-writers objecting to Mr. Vyse's data about the greater happiness of religious people ("Who's Happier?" Letters, July/August 2020) seem to be seeking hypotheses on how his assertion could possibly be true. As a nonbeliever living in the U.S. "Bible Belt" for decades, I have a simple explanation from direct observation.

Christian believers are virtually certain that someone who cares about them has everything under control and will eventually fix the world and give them eternal happiness. We nonbelievers, however, deal with either the certainty of chaos and entropy and death or the discomfort of facing the unknown—things that are widely accepted as traumatic for the human psyche.

In this view, it's not at all surprising that Christians are happier, just as small children, blissfully ignorant of things such as taxes and arthritis, seem generally happier than adults.

Scott Bates
Hurley, Mississippi

Being a hated atheist in either an intensely Christian or Muslim society is a lot harder and a much more punishing life situation than is belonging to a community of believers who endlessly meet with one another to praise themselves and tell one another how happy and how fortunate they are to be believers. Religion necessarily leads to community and group self-praise. Lack of belief is mostly individual and usually is quite punishing, often even requiring the deviant to defend him- or herself emotionally as well as physically against the believers.

Believers do and always have frequently assaulted and killed nonbelievers as a kind of duty. Both Christians and Muslims have a long history of attacking, hurting, and killing unbelievers. It's truly stupid to claim that religion makes people happier than does nonbelief. Of course it does. That's what believers want to impose on those who don't join with them in their collective self-praise.

There really is a war against nonbelievers, remember. And it is continuous, massive, and almost universal.

Joseph W. Burrell
Asheville, North Carolina

## [FEEDBACK

The letters column is a forum on matters raised in previous issues. **Letters should be no longer than 225 words**. Due to the volume of letters we receive, not all can be published. Send letters as email text (not attachments) to letters@skepticalinquirer.org. In the subject line, provide your surname and informative identification, e.g.: "Smith Letter on Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122.

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1012 14th St. NW, Suite 205, Washington, DC 20005
(202) 733-5279 ext. 200
dc@centerforinquiry.org

***CFI West***
2535 W. Temple St, Los Angeles, CA 90026
(323) 666-9797, la@centerforinquiry.org

***CFI Western New York***
1310 Sweet Home Road, Amherst, NY 14228
(716) 636-4869 ext. 402
wny@centerforinquiry.org

### International Branches

***CFI Argentina***
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***CFI Canada***
PO Box 24006
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K2M 2C3
(613) 663-8198
info@centerforinquiry.ca

***CFI China***
China Research Institute for Science
Population
NO. 86, Xueyuan Nanlu Haidian Dist.
Beijing, 100081 China
8610-62170515
Zheng Nian
nzhjx@yahoo.com.cn

***CFI France***
Universite of Nice
Faculte Des Sciences
Parc Valrose, 06108
Nice Cedex 2, France
+33-489.15.02.28 (only on Wed. p.m.)
Henri Broch
Henri.Broch@unice.fr

***CFI Kenya***
Center For Inquiry–Kenya
United Youth Group House, Wing B
Makadara, Jogoo Road
Kenya
George Ongere
geongere@yahoo.com

***CFI Peru***
Calle El Corregidor 318
Urb. El Manzano, Rimac
Lima 25-PERU
Manuel Paz y Mino
humanarazon_peru@yahoo.com

***CFI Poland***
01-876 Warszawa
Ul. Broniewskiego 99/147
Poland
Andrzej Dominczak
dominiczak@wp.pl

***CFI Spain***
Madrid, Spain
Luis Alfonso Gamez
lgamez@terra.es

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## Artist's View of a Planet Where Water Might Exist

This artist's impression shows a view of the surface of the planet Proxima b orbiting the red dwarf star Proxima Centauri, the closest star to the solar system. Discovered in 2016, the roughly Earth-sized planet orbiting our nearest neighboring star might be habitable, according to astronomers using the European Southern Observatory's 3.6-meter telescope at La Silla, Chile, along with other telescopes around the world. The exoplanet is at a distance from its star that allows temperatures mild enough for liquid water to pool on its surface. The double star Alpha Centauri AB also appears in the image.

Image Credit: ESO/M. Kornmesser

*More Information: https://www.nasa.gov/image-feature/artist-s-view-of-a-planet-where-liquid-water-might-exist*